Agilent Cerity Networked Data System for Pharmaceutical QA/QC

Generic Instrument Control

Agilent Technologies

Notices

© Agilent Technologies, Inc. 2003

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Agilent Technologies, Inc. as governed by United States and international copyright laws.

Manual Part Number

G4000-90060

Edition

11/2003

Printed in Germany

Agilent Technologies, Deutschland GmbH
Hewlett-Packard-Strasse 8
76337 Waldbronn

Microsoft ® is a U.S. registered trademark of Microsoft Corporation.

Software Revision

This guide is valid for the A.02.02 revision of the Cerity Networked Data System for Pharmaceutical QA/QC.

Warranty

The material contained in this document is provided "as is," and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Restricted Rights Legend

If software is for use in the performance of a U.S. Government prime contract or subcontract, Software is delivered and licensed as "Commercial computer software" as defined in DFAR 252.227-7014 (June 1995), or as a "commercial item" as defined in FAR 2.101(a) or as "Restricted computer software" as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause. Use, duplication or disclosure of Software is subject to Agilent Technologies' standard commercial license terms, and non-DOD Departments and Agencies of the U.S. Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2) (June 1987). U.S. Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2) (November 1995), as applicable in any technical data.

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

In This Guide...

This guide is a user manual for the Generic Instrument Control function of Agilent Cerity Networked Data System for Pharmaceutical QA/QC. This manual is written for system administrators and end users, who will connect and configure a HP 5890 GC instrument or a non-Agilent instrument to the Agilent Cerity NDS system.

1 Concepts of the Generic Instrument Control

This chapter will give you an overview of the concepts behind Generic Instrument Control in the Agilent Cerity Networked Data System for Pharmaceutical QA/QC.

2 Installation of VSIA

This chapter will present the concept of the device drivers, (Vendor Specific Instrument Adapters) and explain how to install a VSIA on your Cerity NDS system.

3 Instrument connection

This chapter describes how you physically connect a GIC based instrument to the Cerity Pharmaceutical QA/QC system.

4 Configuring a GIC based instrument

This chapter gives an overview on how to configure a third party instrument in the Cerity Networked Data System for Pharmaceutical QA/QC system. It explains the configuration in detail by the means of specific examples. 51

Appendix

This appendix offers you an overview of the supported configurations and setpoints supported by GIC for Hewlett Packard and Shimadzu instruments. 83

Contents

1 Concepts of the Generic Instrument Control 7

Introduction 8
- Purpose of GIC 8
- IQ/OQ GIC Compliance. 9

Concept 10
- Cerity GIC architecture 10
- Developer kit 13
- Licensing 14
- Hardware 15

2 Installation of VSIA 17

Principles of the Installation 18
- Software and Hardware requirements 18
- VSIA Installation 19

Examples 22
- Installation of the HP 5890 VSIA 22
- Installation of the Shimadzu LC-10Avp VSIA 23

3 Instrument connection 25

Overview and Principles 26

Prerequisites 28
- Software and Hardware requirements 28

Agilent 35900E configuration 29
- How to install the RS232C cable 29
- How to install the Remote Start/Stop cable 30
- How to install the Analog signal cable 31

Examples for instrument configuration: 32
- HP 5890 32

HP 5890 with HP 7673 37
Shimadzu LC-10Avp 41

4 Configuring a GIC based instrument 51

Overview integrated instrument vs. modular instrument 52

Adding, moving and removing instruments 54
Prerequisites 54
Adding an instrument 54
Move an instrument 54
Remove an instrument 55

Detailed examples 56
Add a HP 5890/HP 7673 56
Add a Shimadzu LC-10Avp 71
Adding licenses 82
Configuring hardware options 82

5 Appendix 83

Hewlett Packard instruments 84
Supported configurations 84
Setpoints HP 5890 85
Setpoints HP 7673 89

Shimadzu LC-10Avp instrument 91
Supported configurations 91
SCL-10Avp System Controller 92
DGU-14Avp Degasser 93
SPD-10AVvp Detector 94
CTO-10ACvp Column 96
LC-10ADvp Pumps 96
SIL-10ADvp Auto Injector 101

1 Concepts of the Generic Instrument Control

Introduction 8
Concept 10

This chapter will give you an overview of the concepts behind **G**eneric **I**nstrument **C**ontrol in the Agilent Cerity Networked Data System for Pharmaceutical QA/QC.

Generic Instrument Control is abbreviated *GIC* in this manual.

Introduction

Purpose of GIC

Agilent Cerity Networked Data System for Pharmaceutical QA/QC is designed for analytical laboratories involved in routine quality assurance (QA) and quality control (QC). Cerity NDS accesses analytical devices through the use of device-specific software modules called device drivers.

Agilent's Generic Instrument Control concept is a new approach to standardize generic instrument control for non-Agilent instruments. With the **G**eneric **I**nstrument **C**ontrol, short *GIC* you have the advantage to integrate non-Agilent chromatographic instruments into the Cerity architecture. *GIC* is integrated into the core of the Cerity software and is always installed along with Cerity. Through the *GIC* framework, Cerity sees and controls a third party instrument similar to a specific known instrument type such as the LC 1100.

The *GIC* concept allows the development of drivers for third party instruments without changing the Cerity source code. Device drivers, called **V**endor **S**pecific **I**nstrument **A**dapters (*VSIA*), can be developed independently of Cerity, because the interaction between the device driver and the rest of the system is limited to a well-defined interface. This is a clear advantage for companies such as independent hardware vendors, who want to develop their own device drivers.

IQ/OQ GIC Compliance.

The Generic Instrument Control functionality is a clear target for qualification, as mandated by regulatory agencies guidelines. Agilent will offer a qualification service for the *GIC* and *VSIA* non-native instrument control scheme implemented in Cerity, as follows:

Installation Qualification (IQ)

Installation Qualification of the *GIC* drivers will be done as part of the standard Cerity IQ service. This is possible because the *GIC* drivers are an integral part of the Cerity software, and thus always included into every product installation even though they may not be ever exercised until the *GIC* license (G4065AA) is purchased and the *VSIA* drivers are added.

Installation Qualification of the *VSIA* drivers will be done automatically during their installation, as part of it and thus complementary. This will occur both for the Agilent-*VSIA* drivers (like those for the Agilent 5890 GC and the Shimadzu LC); and for those developed by third parties.

Operational Qualification (OQ)

Both the *GIC* and the *VSIA* drivers will be tested in their functionality during the delivery of a new compliance service for non-native instrument communication tests.

This service will exercise the *GIC* drivers and the *VSIA* stub by actually sending data and control commands to the instrument, and verifying that the actual result matches the expected one. It will be delivered at the time of the *VSIA* driver installation, or in subsequent incidences on a per-incident basis when required.

Product description

The non-native instruments communications test will be offered as a single package that will qualify the communication of up to 25 instruments, provided that they are all properly configured and present (active) in the system at the time of the qualification.

Later addition of new instruments will require subsequent delivery of the service to qualify the newly added instruments.

Concept

Cerity GIC architecture

Generic Instrument Control is a concept to connect and configure a HP 5890 or an non-Agilent instruments to the Cerity System via an Analog/Digital Converter. The Cerity system has a built-in software generic control functionality. The concept of *GIC* splits this functionality of Cerity and the information needed to control a third party instrument into independent parts. These independent parts can be installed separately. When adding a new third party instrument, the core Cerity software does not have to be revalidated.

The Cerity generic instrument control consists of two main components: the *GIC* framework and the *VSIA*. The *GIC* framework is installed as part of Cerity for the Pharma Client/Server system software. *GIC* is responsible for handling all the dynamic and configurable user interfaces in the instrument and method context, which are dealing with instrument control, status and error handling and instrument setpoints as part of the Cerity method.

VSIA is the real "instrument driver". It is responsible for the communication to the instrument (downloading method setpoints, reading actual values, error handling etc.) and the translation of the set point values into the control commands the instrument understands. *VSIA* supports "plug-and-play" installation. „Plug-and-play“ allows the installation of *VSIA* files on a running Cerity for Pharma Client/Server system without interrupting the operation. Every third party instrument needs its own specific *VSIA*. Every *VSIA* must be installed separately.

The communication between the *GIC* framework and the *VSIA* is done using the **C**ommon **I**nstrument **C**ontrol **L**anguage, short *CICL*. *CICL* specifications combine a state model, a set of commands and a *COM* interface. Device drivers that adhere to the *CICL* specifications can be plugged into the Cerity software.

The *GIC* framework provides a ready-made library for *VSIA* to interpret *GIC* commands. All *CICL* commands are in XML format. XML provides a great flexibility for communicating device specific parameters, and eases the writing of *VSIA*’s responses. *VSIA* understands the *CICL* commands and translates them to a instrument specific protocol and vice versa.

The definition of all setpoints is done using a industry standard XML file format, which makes it easy to describe the instrument capabilities and setpoints using off-the-shelf tools.

The instrument specific parameters are specified in a device configuration XML file called as *VSIA* XML. This is the starting point, where the *GIC* recognizes a new instrument type and it's properties. The XML configuration file serves as a reference for the installation of the new instrument driver. Sample sources are provided in the developer kit from Agilent to bring additional clarity.

The communication between the *VSIA* and the instrument is established using the Agilent analog/digital converter AD 35900E interface as communication interface. In addition the Agilent AD 35900E is responsible for acquiring the analog signal and converting it into digital data. The standard 10/100 LAN interface connects the Agilent AD 35900E to the data system.

The implementation of *VSIA* into easy to understand generic standards allows advanced customers (future) or an experienced third party companies (today) to program the instrument control portion outside of Agilent.

The *GIC* framework supports following types of devices:

Table 1 Supported devices

Device categories	Description
Pump	Single device of type pump
Injector	Single device of type injector
Column	Single device of type column
Detector	Single device of type detector
Integrated Instrument	A monolithic instrument that may contain more than one device
Auxiliary	Devices other than those mentioned above

The devices are grouped in simple device categories to keep the Cerity user interface consistent with the other existing drivers. Additionally it aids the modular design and development of the device drivers.

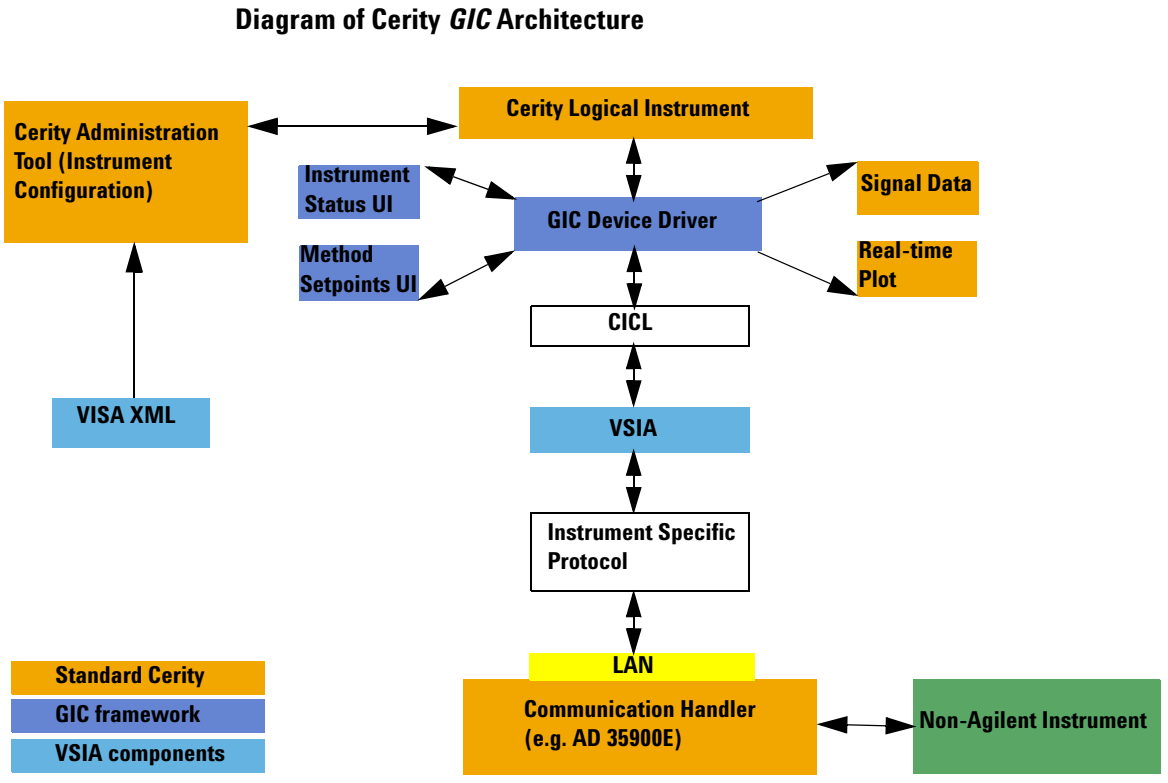

Figure 1 GIC Architecture

Developer kit

Agilent offers a developer kit, which allows other companies to develop their own instrument drivers, which can be plugged into Cerity. This makes it possible to connect nearly every type of chromatographic system to the Cerity Networked Data System. The *VSIA* can be programmed using Visual C++® or Visual Basic®. Appropriate documentation and libraries are available to make the *VSIA* development as efficient as possible.

This new approach allows for standardized instrument control from multiple vendors in one central data system. This flexible concept will allow for easy adaptation to upcoming instrument control standards like LECIS.

The Cerity Generic Instrument Control fully supports localization and software qualification to meet the requirements of FDA's 21 CFR Part11.

Agilent provides a CD with a set of tools for *VSIA* development. Using these tools, the development and integration time is significantly reduced. However, Agilent also allows the use of custom-created tools if required.

Licensing

GIC is a licensed product. To be able to configure and operate a *GIC* based instrument, a valid *GIC* license has to be installed (see adding licenses in the online-help).

For example: If you want to configure two *GIC* based instruments, you would require two *GIC* licenses.

It's possible to configure any number of *VSIA* devices (instrument modules) in a single *GIC* based instrument. You can order a *GIC* license with the product number G4065AA. This includes a AD 35900E license to use only with the *GIC*. The *GIC* licenses are controlled in Cerity like every other instrument license (e.g. 1100 LC).

Agilent offers instrument drivers for the HP 5890 GC (G4066AA) and the Shimadzu LC-10AVP (G4067AA). You need to order one instrument driver (*VSIA*) per instrument.

For example: If you want to control three HP 5890 and two Shimadzu LC, you need to order in addition to the *GIC* license three HP 5890 and two Shimadzu LC driver licenses.

This is only valid for driver licenses sold by Agilent. Since the *VSIA* licenses are not controlled in the Cerity software, third party developers can choose their own licensing scheme, if they write a *VSIA* for customers.

Software requirements

- Licence for every *GIC* Instrument
- Licence for every logical Instrument

NOTE The instrument driver must be installed on the Cerity database server and on every Acquisition controller.

Hardware

The *GIC* concept is based on controlling third party instruments using Agilent's lanable analog digital converter Agilent 35900E. It provides two analog channels for signal acquisition, two RS232C ports for device communication and two remote control ports (APG) for device synchronization. The ADC is the only interface currently available to connect a third party instruments to the Cerity data system. The analog signals are acquired and stored using the standard ADC device driver in Cerity.

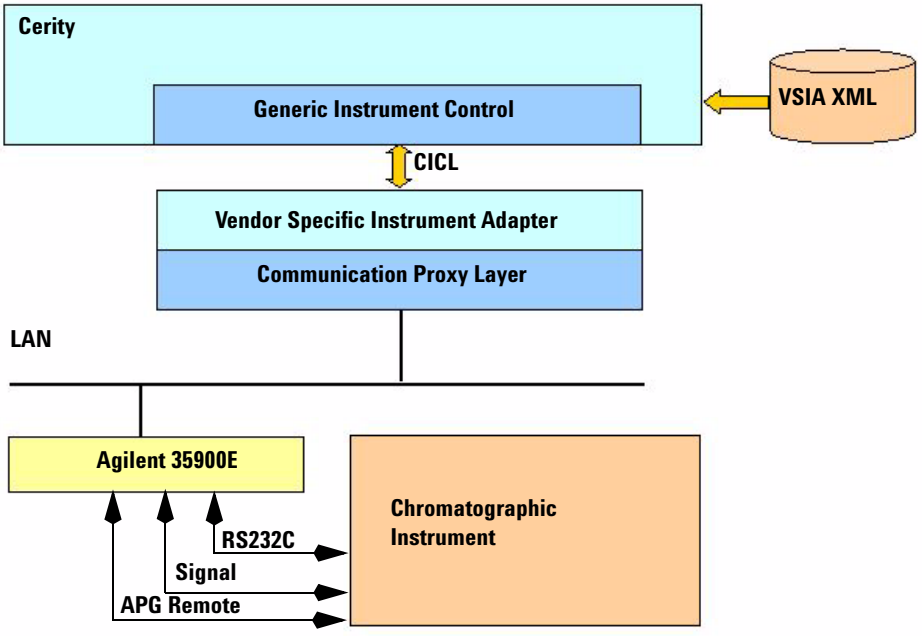

Figure 2 GIC Connections

Hardware requirements

- Agilent 35900E with LAN interface
- RS232C cable
- Start/stop cable
- Analytical instrument
- Cerity server
- Acquisition controller
- Analog signal cable

1 Concepts of the Generic Instrument Control

Concept

2
Installation of VSIA

Principles of the Installation 18
Examples 22

This chapter will present the concept of the device drivers, (**V**endor **S**pecific **I**nstrument **A**dapters) and explain how to install a VSIA on your Cerity NDS system.

Principles of the Installation

Software and Hardware requirements

Hardware

You require:

- the analytical instrument which will be connected
- ADC converter
- RS232C cable
- APG Remote start/stop cable
- Analog signal cable
- Cerity server
- Acquisition controller

Software

You require:

- The current version of Cerity (at least Cerity A02.02)
- *VSIA* software CD-ROM
- MSXML 4.0 installed (can be found on the Cerity for pharmaceutical QA/QC product CD-ROM)

VSIA Installation

The components of *VSIA* are packaged in a installation set-up program. The installation set-up program is run from a CD and copies the *VSIA* device driver binaries and its supporting files onto the Cerity system.

Cerity requires the following *VSIA* components to support non-Agilent devices:

- *VSIA* XML files.
- *VSIA* device driver binaries.
- Compliance reference files
- Device manuals (optionally)

NOTE

VSIA is only installed on the Data Base Server and the Acquisition controller.

Do not install *VSIA* files on the Review Client. The reference to "<Cerity>" is the directory path where the Cerity software is installed.

The installation program copies the *VSIA* files into the following directory structures:

Driver and NLS files

Device driver binaries and its language files should be copied into following directory structure:

<Cerity>\Common\Configuration\CerityVSIADrivers\Drivers

==> this will hold *VSIA* binaries.

<Cerity>\Common\Configuration\CerityVSIADrivers\nls

==> this will hold *VSIA nls* binaries.

Gas chromatograph VSIA XML files

Each type of device has it's special directory.

For example The *VSIA* for a GC detector device will be installed under:

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\GC\Detector directory.

The other devices are installed in their respective directories.

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\GC\Pump

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\GC\Injector

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\GC\Column

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\GC\Detector

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\GC Integrated Instrument

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\GC\Auxiliary

Liquid chromatograph VSIA XML files

The same principle of installation that applies to the GC type instruments, applies to the LC type instruments too.

For example The *VSIA* for a LC pump will be installed under:

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\LC\Pump directory.

The other devices are installed in their respective directories.

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\LC\Pump

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\LC\Injector

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\LC\Column

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\LC\Detector

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\LC\Integrated Instrument

<Cerity>\Common\Configuration\Cerity*VSIA*Drivers\LC\Auxiliary

Compliance reference files:

VSIA compliance reference will be installed in following directory:

<Cerity>\Compliance\IQT

Examples

The following paragraphs explain how to install a HP 5890 *VSIA* or a Shimadzu LC-10Avp.

Installation of the HP 5890 VSIA

Prerequisites

User To install a new *VSIA* the user must have administrator rights:

- in Cerity
- on the local OS
- for the network system

Software

- Installation CD-ROM HP 5890 *VSIA*

Installation

1. Put the CD-ROM into the CD-ROM drive.
2. Click on **setup.exe**.
3. The installation wizard opens.
4. Click on **Next.**
5. Follow the instructions of the installation wizard.
6. Click on **Finish**.
7. The *VSIA* XML file is installed and registered.

Installation of the Shimadzu LC-10Avp VSIA

Prerequisites

User To install a new *VSIA* the user must have administrator rights:

- in Cerity
- on the local OS
- for the network system

Software

- Installation CD-ROM Shimadzu LC-10Avp *VSIA*

Installation

1. Put the CD-ROM into the CD-ROM drive.
2. Click on **setup.exe**.
3. The installation wizard opens.
4. Click on **Next**.
5. Follow the instructions of the installation wizard.
6. Click on **Finish**.
7. The *VSIA* XML file is installed and registered.

3
Instrument connection

Overview and Principles 26
Prerequisites 28
Agilent 35900E configuration 29
Examples for instrument configuration: 32

This chapter describes how you physically connect a GIC based instrument to the Cerity Pharmaceutical QA/QC system.

Overview and Principles

To connect a third party chromatographic instrument to the Cerity system, you need an ADC converter, that converts the instrument's analog output to digital Cerity input.

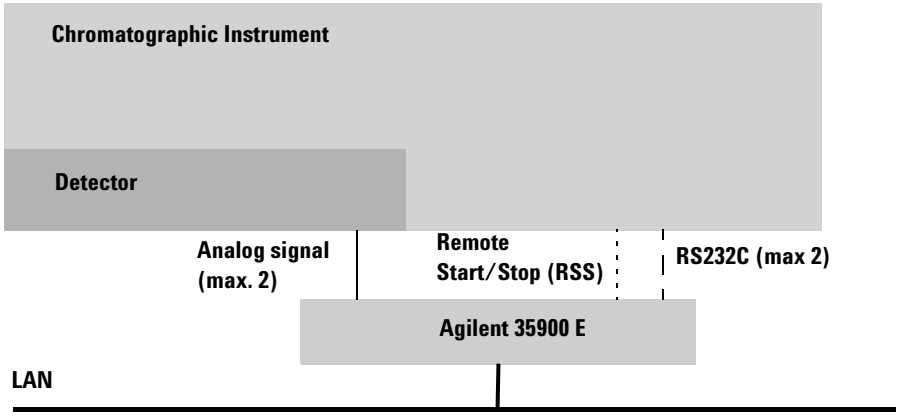

Figure 3 General connection structure of an analytical instrument

The connection via the standardized RS232C interface ensures, that virtually any analytical instrument can be connected to the Cerity data system.

NOTE The length of the RS232C cable should not exceed 15 meters.

The connection consists of three types of cables:

- RS232C cable
- Remote start/stop cable
- Analog signal cable

The RS232C cable is used to:

- Communicate with the instrument
- Transfer the method setpoints
- Read actual values and status information
- Get event information (e.g. errors)

The RSS cable is used to:

- Synchronize the start of the instruments devices. Typically triggered by the injector.

The Analog signal cable is used to:

- Transfer the detectors analog output to the ADC converter.

Prerequisites

Software and Hardware requirements

To connect a third party chromatographic instrument you require:

Hardware

- Third party instrument
- ADC converter
- RS232C cable
- Start/Stop cable
- Analog signal cable
- Cerity Network, LAN

Software

- Cerity Licences
- *GIC* Licences
- *VSIA* Licences
- *VSIA* Driver

Agilent 35900E configuration

The Agilent 35900E is a core component to connect non-Agilent instruments to the Cerity network.

WARNING **Switch off the power for all instruments and devices before you start connecting cables.**

Danger! High voltage!

How to install the RS232C cable

The RS232C cable is used to transfer method setpoints, actual values, status information and event information between the ADC and the instrument.

1 Select the RS232C cable.

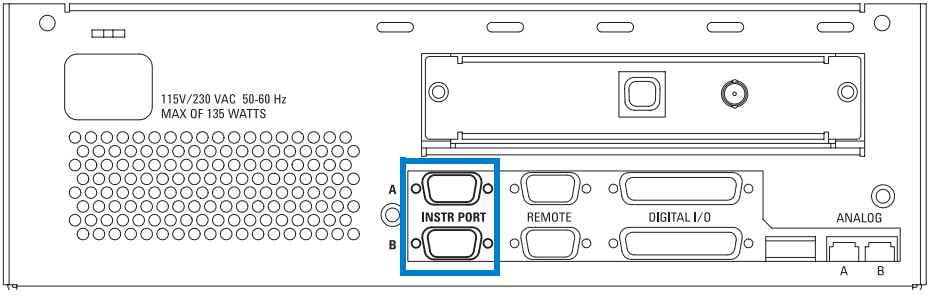

Figure 4 RS232C socket - ADC rear view

a Insert the female connector into the male plug of the selected channel of the ADC.

b Tighten the protection screws.

c Insert the female connector into the male plug at the instrument.

d Tighten the protection screws.

How to install the Remote Start/Stop cable

The RSS cable is used to synchronize the start. Typically it is triggered by the injector.

2 Select the RSS cable.

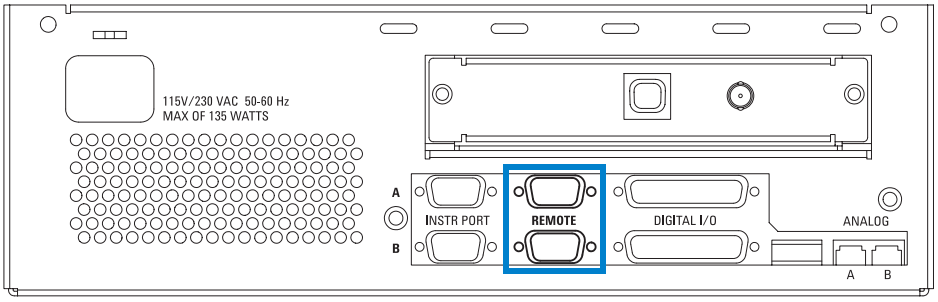

Figure 5 Remote Start/Stop socket ADC rear view

a Insert the male connector into the female plug of the destined remote channel of the ADC.

b Tighten the protection screws.

c Insert the male connector into the female plug at the instrument.

d Tighten the protection screws.

How to install the Analog signal cable

The Analog signal cable transfers the detectors analog output to the ADC.

3 Select the Analog signal cable.

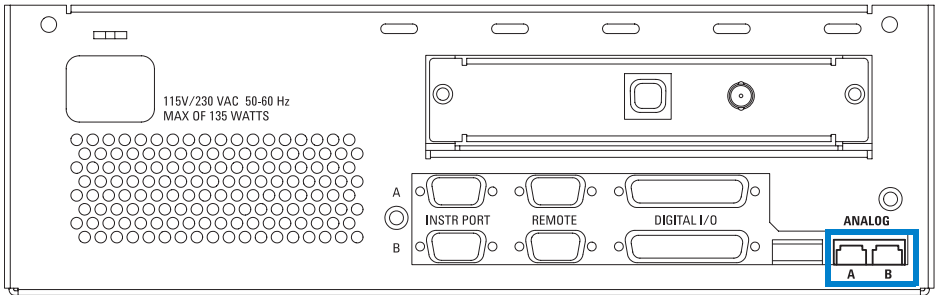

Figure 6 Analog signal cable plug

a Insert the male connector into the female plug in the destined channel of the ADC until you hear the „snap-in“ click.

b Connect the cable to the instrument (differs by instrument type).

Examples for instrument configuration:

HP 5890

In this example the HP 5890 is connected to channel A of an ADC. You can connect it to channel B as well.

Required Hardware:

1 One ADC with at least one channel free
2 One RS232C cable - type G1530-60610
3 One RSS cable - type 35900-60700
4 One Analog signal cable - type 35900-60610

Supported configurations

The supported configurations are listed in the appendix at the back of the manual please refer to “Supported configurations” on page 84.

Cabling

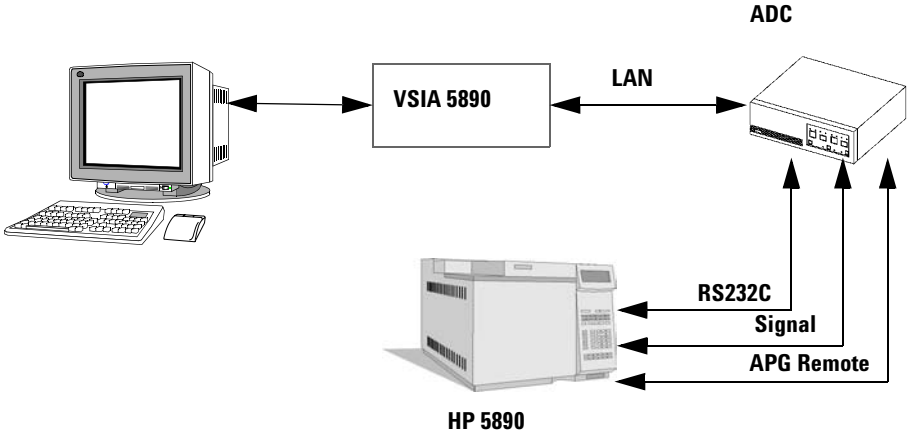

Figure 7 Cable connections HP 5890

NOTE

Always tighten protection screws.

Always insert plugs until you hear the „snap-in“ click.

1 Connect the RS232C cable from the ADC to the HP 5890 as shown in Figure 8.

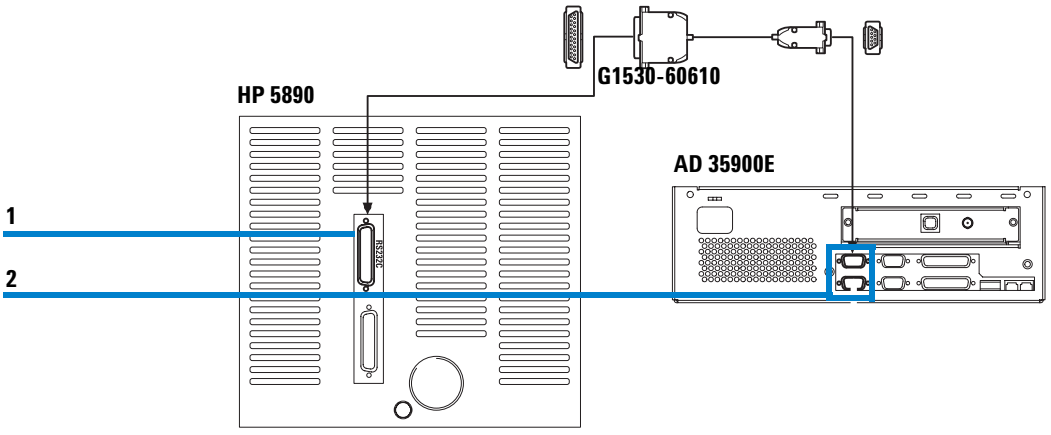

Figure 8 Connection RS232C to HP 5890

a Insert the female connector into the male plug RS232 port at the rear of the HP 5890 Pos. 1.

b Insert the female connector into the male plug of the selected channel (A or B) of the ADC Pos. 2.

2 Connect the Remote start/stop cable as shown in Figure 9.

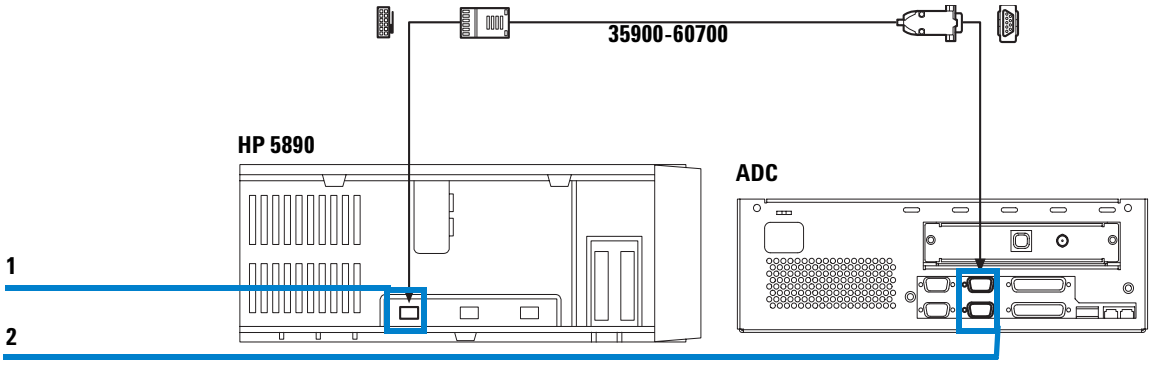

Figure 9 Connection RSS to HP 5890

a Insert the female connector into the male plug at the top of the HP 5890 in the remote port connector Pos. 1.

b Insert the male connector into the female plug of the destined remote channel (either A or B) at the ADC Pos. 2.

3 Connect the Analog signal cable as shown in Figure 10.

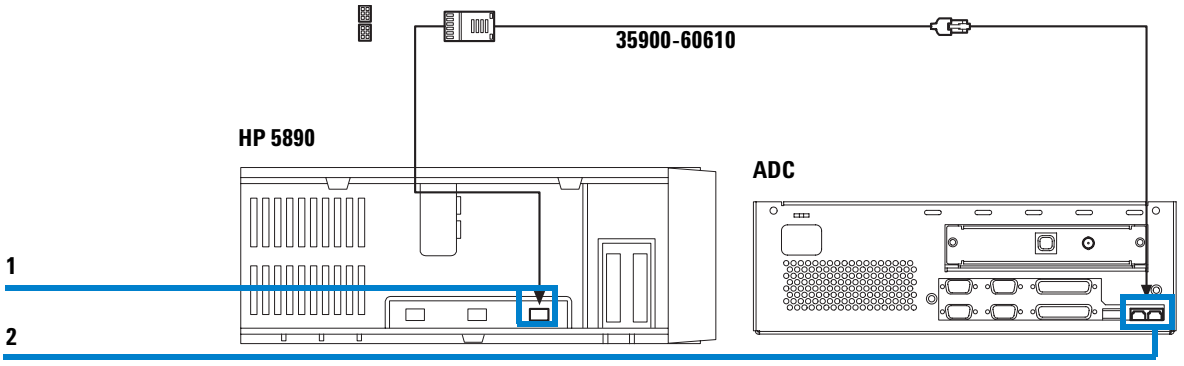

Figure 10 Connection Analog signal cable to HP 5890

a Insert the female connector into the male plug at the top of the HP 5890 in the signal 1 or signal 2 connector port Pos. 1.

b Insert the male connector into the female plug in the analog channel A or B of the ADC Pos. 2 until you hear a „snap-in“ click.

RS232C configuration

The ADC and the instrument are using the RS232C interface to communicate.

NOTE

The ADC and the instrument have to use the same RS232C parameters.

Changing RS232C parameters at the HP 5890

1 To set the RS232C parameters at the HP 5890 extract the 5890 dice card A15012 from the instrument.

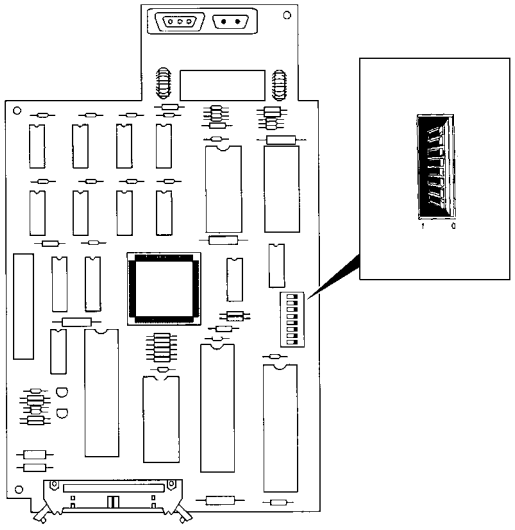

Figure 11 Dip switches on 5890 dice card

2 For the *GIC*configuration set all dip switches to the position 0.

3 Set the Baud rate to 19,2 K (19200 Baud).

HP 5890 with HP 7673

This is an example how to connect the Hewlett Packard gas chromatograph HP 5890 with the autosampler HP 7673 as a logical instrument.

Required Hardware:

1 One ADC with one or two channels free.

2 Two RS232C cables - type G1530-60610

3 Two RSS cables (Y-Cable) - G1512-60530 and G1530-60930

4 One Analog signal cable - type 35900-60610

Supported configurations

The supported configurations are listed in the appendix at the back of the manual please refer to “Supported configurations” on page 84.

Cabling

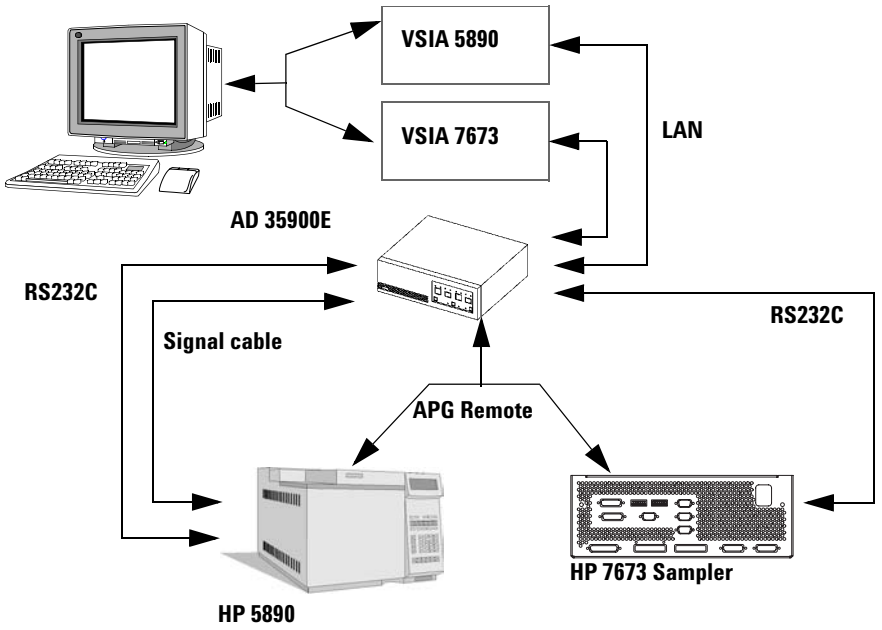

Figure 12 Cable connections HP 5890 with HP 7673 Sampler

NOTE

Always tighten the protection screws.

Always insert plugs until you hear a „snap-in“ click.

1 Connect the RS232C cable from the ADC to the HP 5890 and to the HP 7673 as shown in Figure 13.

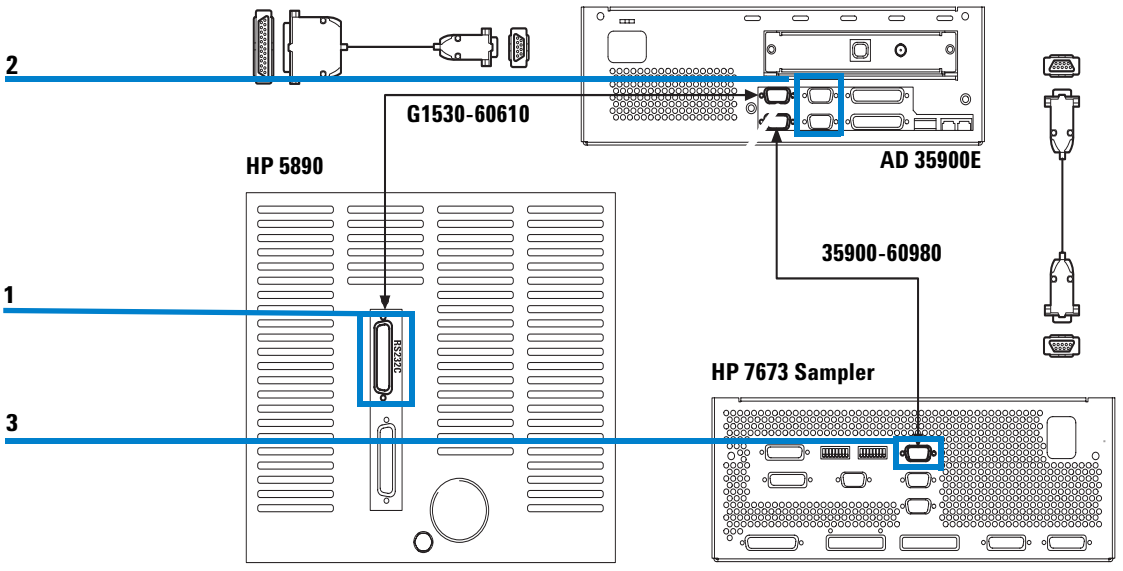

Figure 13 Connection RS232C to HP 5890 and HP 7673

a Insert the female connector into the male plug RS232 port at the rear of the HP 5890 Pos. 1.

b Insert the female connector into the male plug of the selected channel (A or B) of the ADC Pos. 2.

c Insert the female connector into the male plug 6890 port at the rear of the HP 7673 Pos. 3.

d Insert the female connector into the male plug of the selected channel (A or B) of the ADC Pos. 2.

2 Connect the Remote start/stop cable as shown in Figure 14.

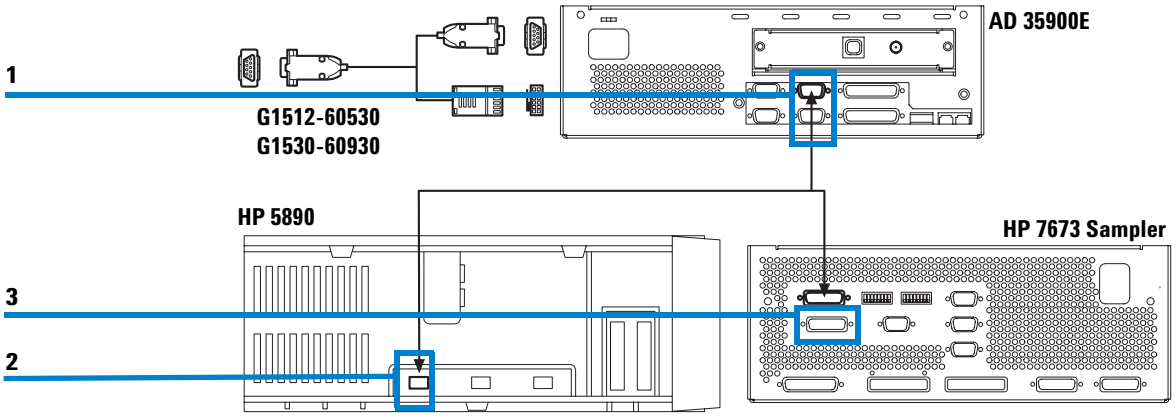

Figure 14 Connection RSS to HP 5890 and HP 7673

NOTE When you connect the HP 5890 and the HP 7673 to the ADC always use the remote port A at the ADC.

a Insert the male connector into the female plug of the destined remote channel A at the ADC Pos. 1.

b Insert the male connector into the female plug at the top of the HP 5890 in the first analog channel Pos. 2.

c Insert the male connector into the female plug at the rear of the HP 7673 in the remote port Pos. 3.

3 Connect the Analog signal cable as shown in Figure 15.

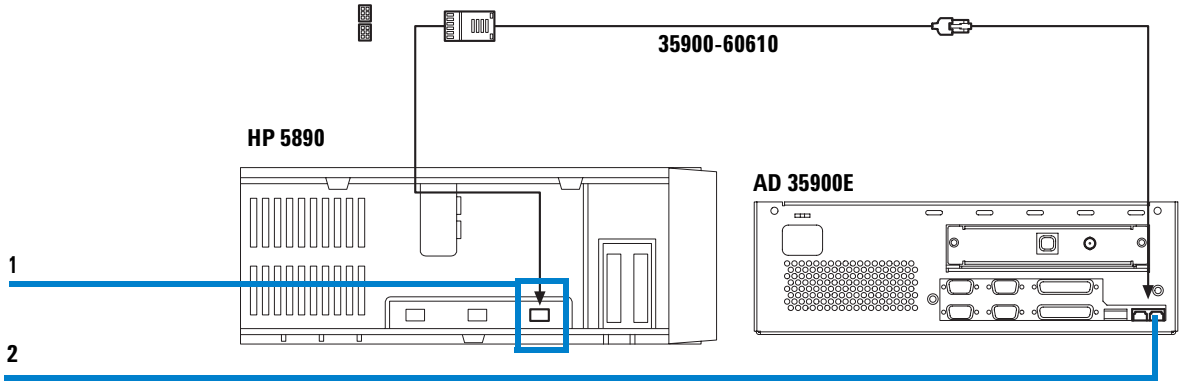

Figure 15 Connection Analog signal cable to HP 5890 and HP 7673

a Insert the male connector into the female plug at the top of the HP 5890 in the third analog channel Pos. 1.

b Insert the male connector into the female plug in the analog channel A or B of the ADC Pos. 2 until you hear a „snap-in“ click.

Shimadzu LC-10Avp

This is an example how to connect the Shimadzu LC-10Avp liquid chromatograph as an integrated instrument. In this example the Shimadzu system controller SCL-10 Avp is connected to the ADC. The cables between the Shimadzu instruments and the ADC can be connected through a Shimadzu “terminal block” or other connectors for spade lug cables.

Required Hardware:

1. One ADC with one or two channels free.
2. One RS232C cable - type 220-91037-01
3. Two RSS cables
   - Type 35900-60670 (2M) or 35900-60920 (5M) for the ADC
   - Event cable 220-91037-01 or 228-35070-00 for the Shimadzu system controller
4. Two Analog signal cables
   - Type 35900-60630 (2M) or 35900-60900 (5M) for the ADC
   - Type 228-39306-91 or 228-39306-00 for the Shimadzu detector.

Supported configurations

The supported configurations are listed in the appendix at the back of the manual please refer to “Supported configurations” on page 91.

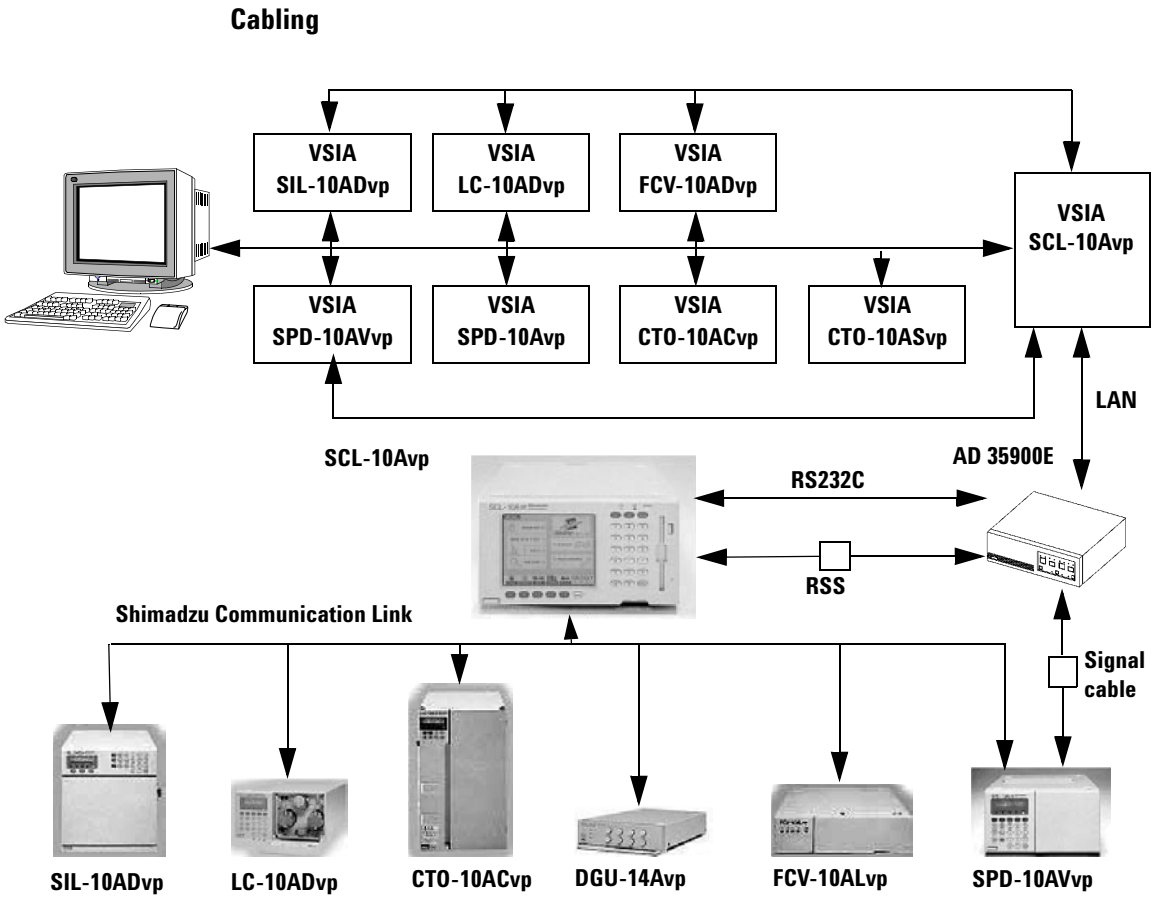

Figure 16 Cable connections Shimadzu LC-10Avp with ADC

NOTE

Always tighten the protection screws.

Always insert the plugs until you hear a „snap-in“ click.

Do not leave unconnected, loose wires.

1 Connect the RS232C cable as shown in Figure 17.

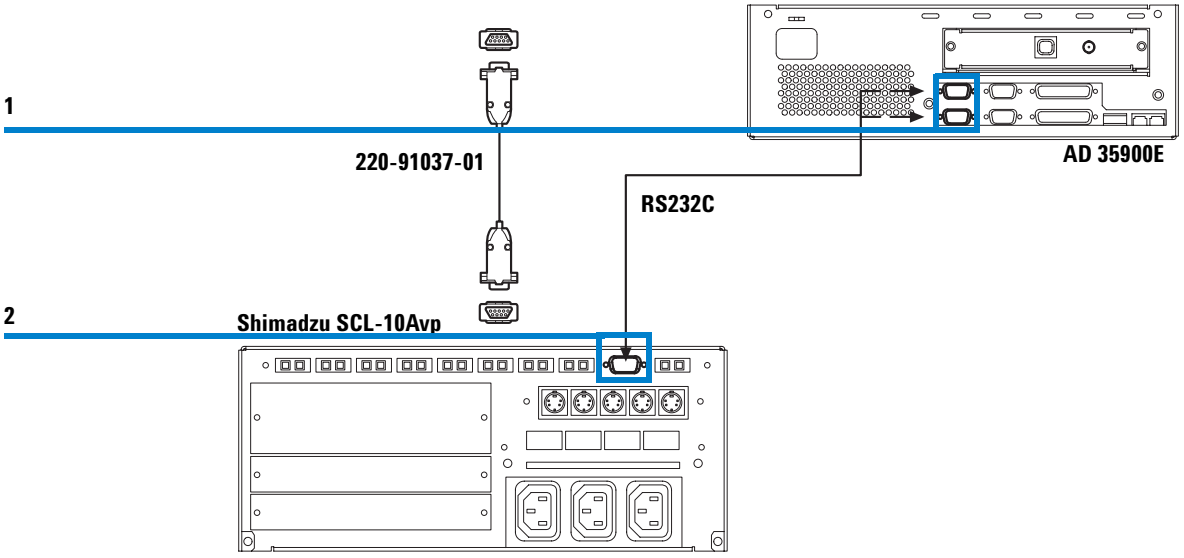

Figure 17 Connection RS232C from the ADC to the Shimadzu SCL-10Avp

a Insert the female connector into the male plug of the selected channel (A or B) of the ADC Pos. 1.

b Insert the female connector into the male plug RS232C port at the rear of the Shimadzu system controller SCL-10Avp Pos. 2.

2 Connect the Remote start/stop cables as shown in Figure 18. A Shimadzu “terminal block” or another connector for spade lug cables connects the two Remote start/stop cables.

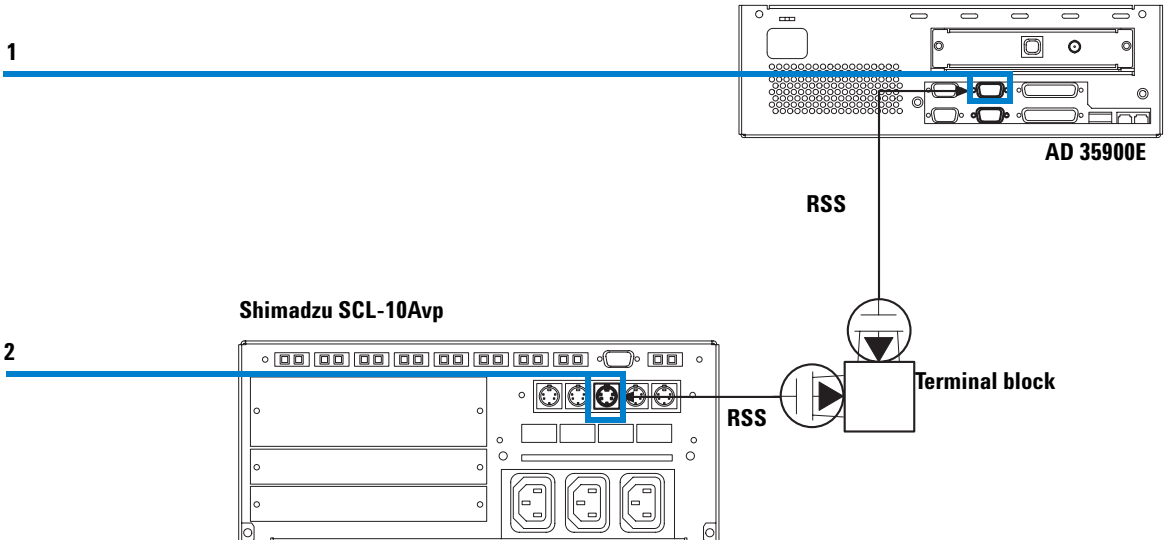

Figure 18 Connection RSS from the ADC to the Shimadzu SLC-10Avp

NOTE When you connect the Shimadzu LC-10Avp to the ADC in „Dual Channel configuration“, always use the remote port A at the ADC.

a Insert the male connector into the female plug of the destined remote channel at the ADC Pos. 1.

b Connect the spade lug cables to the terminal block.

c Insert the female connector into the male plug „Event Out 1.3“ port at the rear of the Shimadzu system controller SCL-10Avp Pos. 2.

d Connect the spade lug cables to the terminal block.

Table 2 Color coding of spade lug cables for the connection ADC and Shimadzu SCL 10Avp

Agilent	Shimadzu
red	brown
black	orange

3 Connect the Analog signal cables as shown in Figure 19. A Shimadzu "terminal block" or another connector for spade lug cables connects the two analog signal cables.

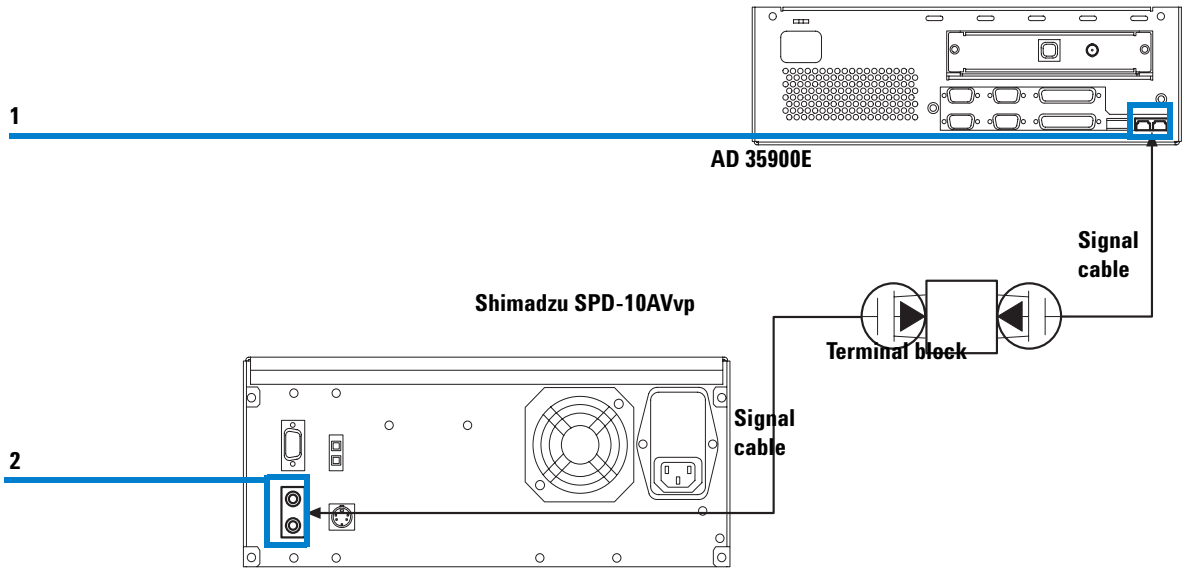

Figure 19 Connection Analog signal cable from the ADC to the Shimadzu SPD-10-AVvp

a Insert the male connector into the female plug of the destined Analog signal channel A or B at the ADC Pos. 1.

b Connect the spade lug cables to the terminal block.

c Insert the female connector into the male plug Analog signal port at the rear of the Shimadzu detector SPD-10AVvp Pos. 2.

d Connect the spade lug cables to the terminal block.

Table 3 Color coding of spade lug cables for the Analog signal connection and Shimadzu SPD 10AVvp

Agilent	Shimadzu
red	white (+)
black	orange (-)
orange	(shield not connected)

Settings on SCL-10ADvp system controller

1 Switch the system controller on to set the system configuration. The following screen is displayed.

Figure 20 Start screen system controller

2 Press the **Menu** function button `f5`. The following screen opens on the display.

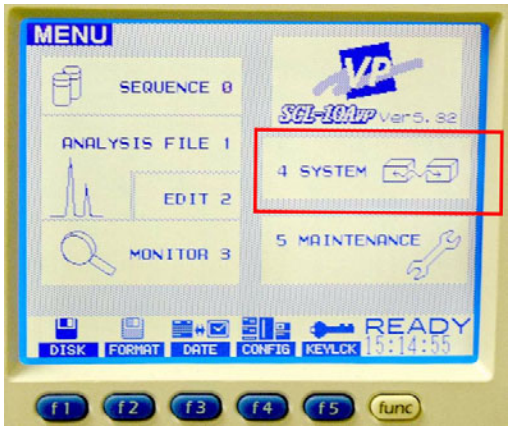

Figure 21 Screen Menu

3 Press the key `4` on the numeric keyboard next to your display. The screen **System** opens.

Figure 22 Screen System

4 If the event cable is correctly installed as described in Figure 18 on page 44, you can select **Relay 1**.

   a To navigate between settings on the screen use the `arrow` buttons on the numeric keyboard next to the display.

5 Change the **Relay 1** setting to **Start**.

6 Press the button `Enter` on the numeric keyboard.

7 Press the **Next** function button `f3` to open the screen **Communication Setting**.

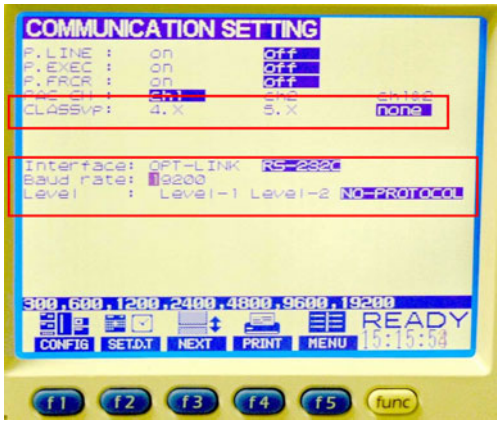
COMMUNICATION SETTING
P.LINE : on Off
P.EXEC : on Off
P.ERCR : on Off
CLASSVP: 4.X 5.X none
Interface: GPT-LINK RS-232C
Baud rate: 19200
Level : Level-1 Level-2 NO-PROTOCOL
300 600 1200 2400 4800 9600 19200
READY
CONFIG SET.DT NEXT PRINT MENU
f1 f2 f3 f4 f5 func

Figure 23 Screen Communication Setting

8 Set the **ClassVP** value to **none**.

9 Set the **Interface** to **RS232C**.

10 Set the **Baud rate** to **19200**.

11 Set the **Level** to **NO-PROTCOL**.

12 Exit screen by pressing the **Menu** function button `f5`.

13 Turn your instrument off and then on again.

14 Your configurations are set.

Mixed configuration with 1100 modules

The Shimadzu LC-10Avp can be operated in a mixed configuration with any 1100 instrument module. With this configuration you need a 1100 instrument control license in addition to the *GIC* and *VSIA* license.

Examples for instrument configuration:

4
Configuring a GIC based instrument

Overview integrated instrument vs. modular instrument 52
Adding, moving and removing instruments 54
Detailed examples 56

This chapter gives an overview on how to configure a third party instrument in the Cerity Networked Data System for Pharmaceutical QA/QC system. It explains the configuration in detail by the means of specific examples.

Overview integrated instrument vs. modular instrument

The *GIC* framework supports two kind of instrument set-ups, the integrated and the modular instrument.

Integrated instrument

The integrated instrument consists of several integrated components (for example: a gas chromatograph which contains an injection port, a column oven and a detector), which are operated by an controller. To set up and configure the instrument in Cerity, you have to add and configure this integrated instrument. An integrated instrument typically needs only a single RS232C connection to the ADC converter.

Modular instrument

The modular instrument consists of several modular devices (injector, pump, oven etc.), which are added and configured in Cerity as a single instrument. Such a modular instrument can be connected by a single or multiple RS232C channels to the ADC. Each modular device has to be added and configured in the instrument set-up in Cerity separately.

NOTE

Because of a condition in the *GIC* software, you may not configure two modules of the same type of device within a single instrument set-up. For example, you cannot select two modules of the type detector with a sampler and a pump. This condition is not valid for the integrated instrument set-up.

The *GIC* framework supports the following kind of devices.

Table 4 Supported devices

Device categories	Description
Pump	Single device of type pump
Injector	Single device of type injector
Column	Single device of type column
Detector	Single device of type detector
Integrated Instrument	A monolithic instrument that may contain more than one device
Auxiliary	Devices other than those mentioned above

Adding, moving and removing instruments

Prerequisites

- The instruments are physically connected to the ADC.
- The ADC is connected to the network and has a valid IP address.
- The Acquisition controller is connected to the network.
- The *VSIA* files are installed on the Cerity database server and the Acquisition controller(s).
- The user has administrator rights in Cerity, the operating system and in the network.

Cerity Software Administration Program

Cerity is Microsoft conform and uses the Microsoft Management Console (MMC) to install, add and configure instruments. Please refer to the Cerity operating manual for information about the Cerity software administration.

Adding an instrument

To add an instrument to an Acquisition controller, expand the Acquisitions controller folder in the selection tree and select **Add Instrument** from the context menu with a right-click or the menu bar.

Move an instrument

To move an instrument to another Acquisition controller, you right-click the instrument and select from the context menu **Move to Acquisition Controller**. Select the new Acquisition controller to which you want to configure the instrument. The system disconnects the instrument and its devices from the current Acquisition controller, and configures them on the new Acquisition controller.

Remove an instrument

To remove an instrument from an Acquisition controller, you right-click the instrument and select from the context menu **Remove Instrument**. The system removes the instrument and all it's devices from the Cerity configuration.

Detailed examples

Add a HP 5890/HP 7673

In this example the HP 5890 device is configured with an ADC converter and a HP 7673 sampler as a logical instrument. The HP 5890 itself is an integrated device.

1 Open the Cerity software administration program.

a Click in the selection tree on the folder of the Acquisitions controller for which you want to add an instrument.

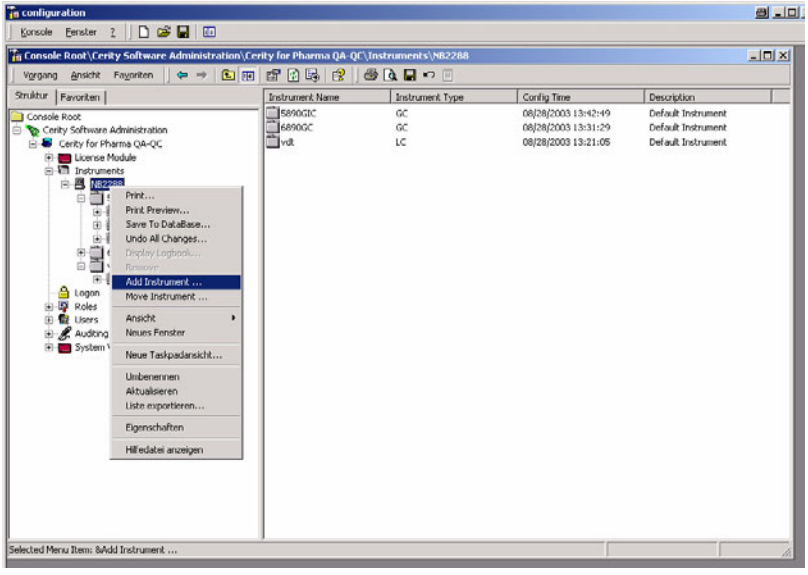

Figure 24 Add instrument

b Click on the menu item **Action** and select **Add Instrument**, or

c open the context menu with a right-click and select **Add Instrument**.

2 The dialog **Add New Instrument** opens.

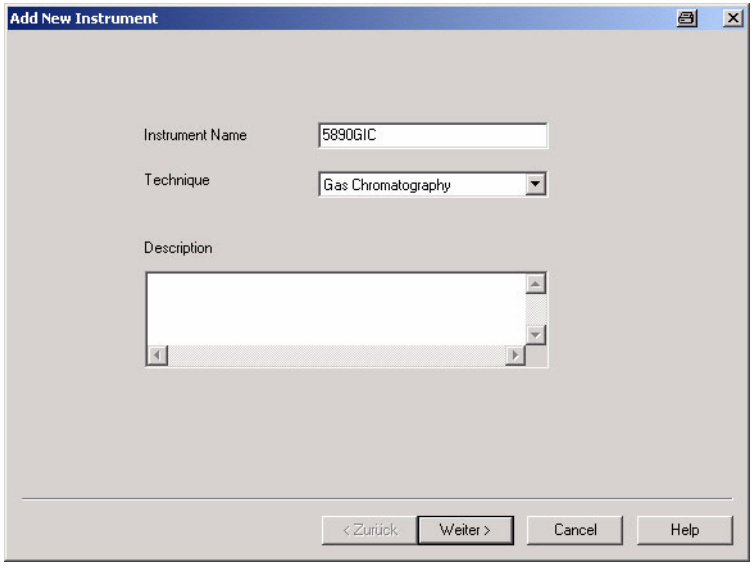

Figure 25 Add new instrument

a Enter the instrument name (for example `5890GIC`) in the field **Instrument Name**.

b Select **Gas chromatography** from the drop-down list **Technique**.

c Enter a description in the field **Description** (optional).

d Click on button **Next**.

3 The dialog **Configure Instrument** opens.

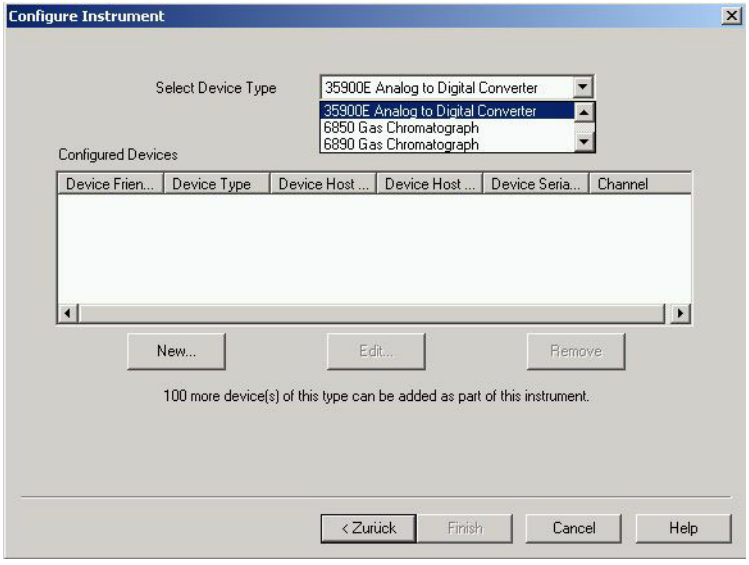

Figure 26 Configuration Instrument

a Select from the drop-down list **Select Device Type** first the item **35900E Analog to Digital Converter**.

b Click on button **New**.

4 The dialog **Identification** opens.

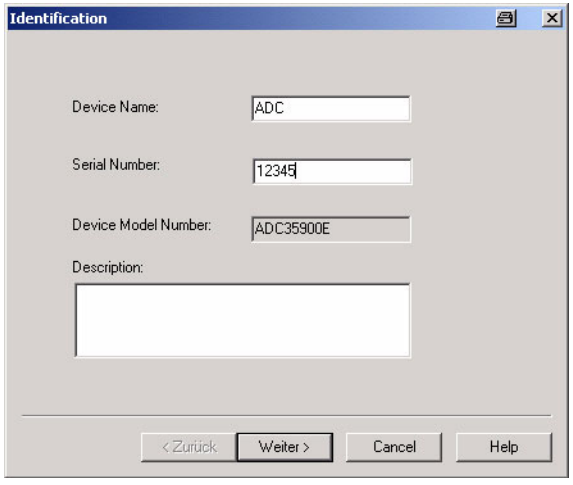

Figure 27 Identification

a Configure the ADC.

b Enter the device name (e.g. ADC) in the field **Device Name**.

c Enter in the field **Serial Number** the serial number of the device.

d Enter in the field **Description** a description of the device (optional).

e Click on button **Next**.

5 The dialog **Connections** opens.

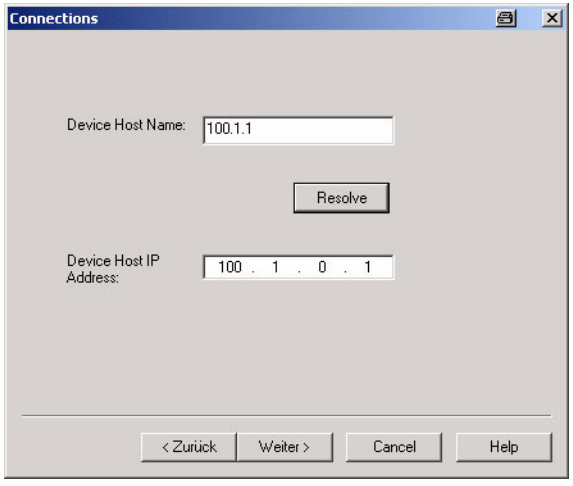

Figure 28 Connections

a Enter the host name or IP address of the ADC into the field **Device Host Name.**

b Click on button **Resolve**.

c The IP address is displayed in the field **Device Host IP Address**.

d Click on button **Next**.

6 The dialog **Channel Information** opens.

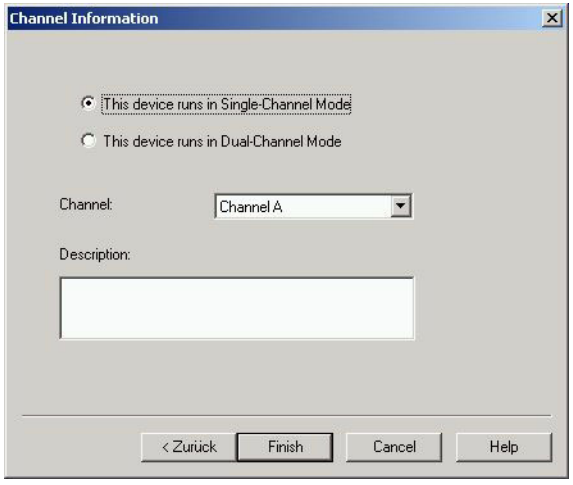

Figure 29 Channel information

a Check either the option **„This device runs in Single-Channel Mode“** or the option **„This device runs in Dual-Channel Mode“**.

Single-Channel Mode

If you choose the Single-Channel Mode, you can connect a single HP 5890 with an HP 7673 autosampler or up to two HP 5890 GCs without an autosampler to the ADC. This mode only allows you to acquire one signal from a single detector.

Dual-Channel Mode

If you choose the Dual-Channel Mode, you can connect a single HP 5890 (with or without an HP 7673 auto sampler) to the ADC. This mode allows you to acquire data from one or two detectors at the same time.

b Depending on which physical channel your instrument is connected to the ADC, select from the drop-down list **Channel A** or **B** (You can only choose between **Channel A** or **B** in the Single-Channel Mode).

c Enter a description in the field **Description** (optional).

d Click on button **Finish**.

7 The dialog **Configure Instrument** opens. The just configured device ADC is displayed in the **Configured Devices** table.

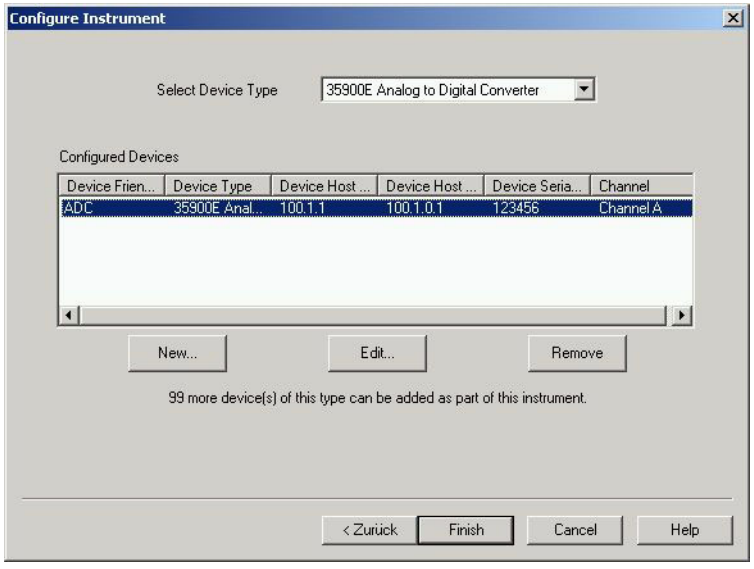

Figure 30 Configure instrument

a To add the 5890 device to the instrument select the device type **Integrated Instrument** from the drop-down list **Select Device Type.**

b Click on button **New.**

8 The dialog **Identification** opens.

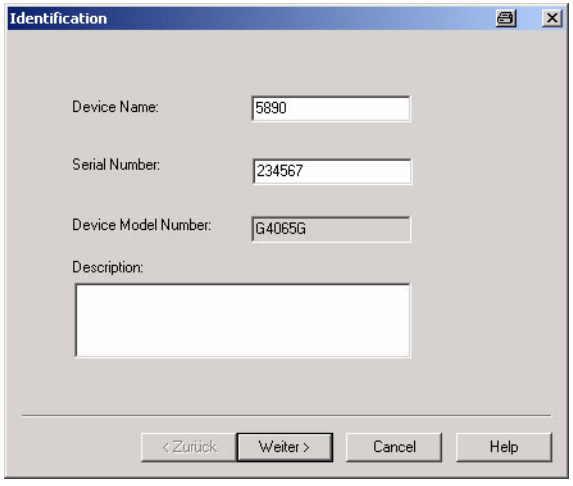

Figure 31 Identification HP 5890

a Configure the HP 5890

b Enter the device name (e.g. `5890`) in the field **Device Name**.

c Enter in the field **Serial Number** the serial number of the device.

d Enter in the field **Description** a description of the device (optional).

e Click on button **Next**.

9 The dialog **Module Configuration** opens.

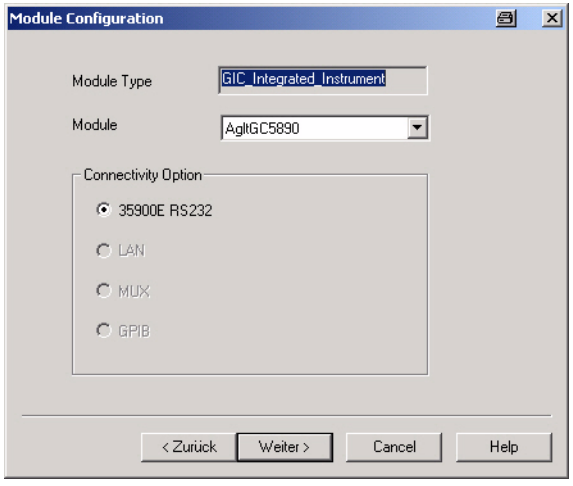

Figure 32 Module configuration

a The field **Module Type** displays the identification of the device, in this case **GIC_Integrated_Instrument**.

b Select from the drop-down list **Module** the instrument you want to add, in this case **AgItGC5890**.

c Check the **Connectivity** option box for the instrument, in this case **35900E RS232.**

d Click on button **Next**.

10 The dialog **35900E RS232 Configuration** opens.

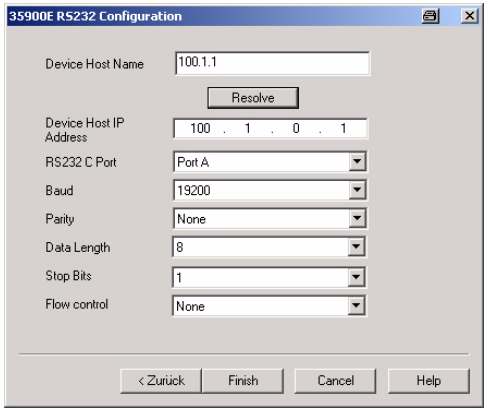

Figure 33 35900E RS232 Configuration

a Enter the host name or IP address of the Agilent 35900E to which the instrument is connected into the field **Device Host Name.**

b Click on button **Resolve**.

c The IP address is displayed in the field **Device Host IP Address**.

d Select from the drop-down list **RS232C Port** the ADC channel, to which the device is connected with the RS232C cabling. In this case the device is cabled to **Port A** at the ADC.

e Use the default settings in the other drop-down lists.

f Click on button **Finish**.

11 The dialog **Configure Instrument** opens. The just configured device HP 5890 is displayed in the **Configured Devices** table.

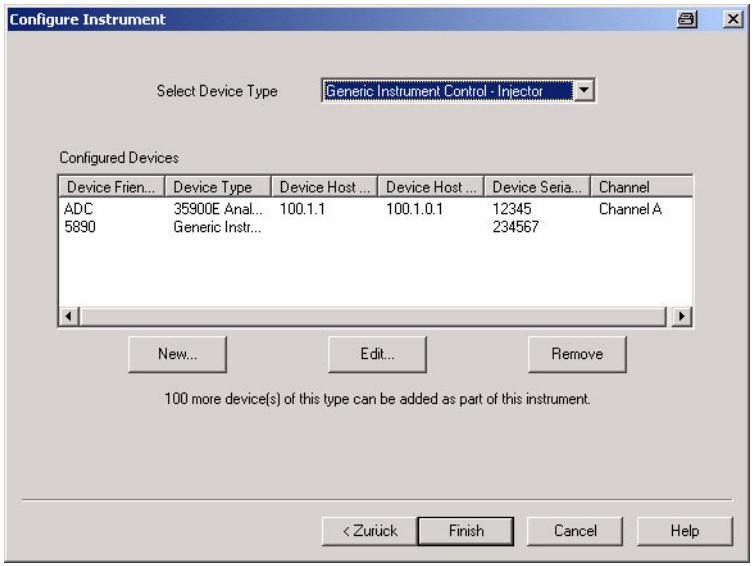

Figure 34 Configured device HP 5890

NOTE This is an example of an optional configuration. The HP 5890 can be configured with and without the HP 7673 autosampler.

a To add an additional device (e.g. HP 7673) to the instrument select the device **Generic Instrument Control-Injector** from the drop-down list **Select Device Type.**

b Click on button **New.**

12 The dialog **Identification** opens.

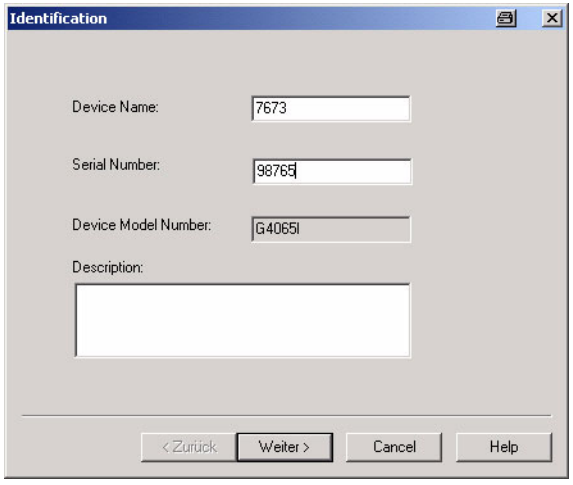

Figure 35 Identification HP 7673

a Configure the HP 7673

b Enter the device name (e.g. `7673`) in the field **Device Name**.

c Enter in the field **Serial Number** the serial number of the device.

d Enter in the field **Description** a description of the device (optional).

e Click on button **Next**.

13 The dialog **Module Configuration** opens.

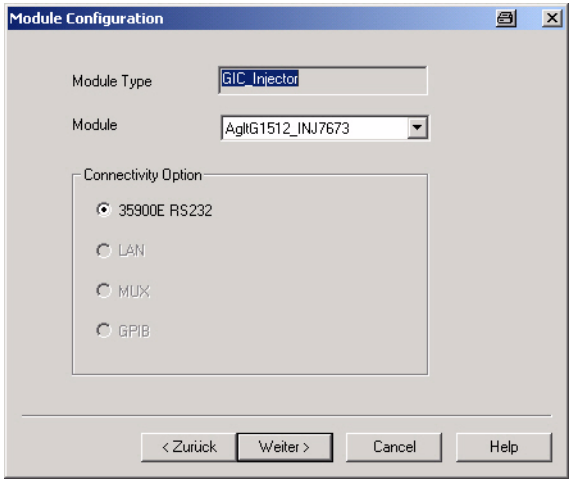

Figure 36 Modul Configuration

a The field **Module Type** displays the identification of the device, in this case **GIC_Injector**.

b Select from the drop-down list **Module** the instrument you want to add, in this case **AgltGC1512_INJ7673**.

c Check the **Connectivity** option box for the instrument, in this case **35900E RS232.**

d Click on button **Next**.

14 The dialog **35900E RS232 Configuration** opens.

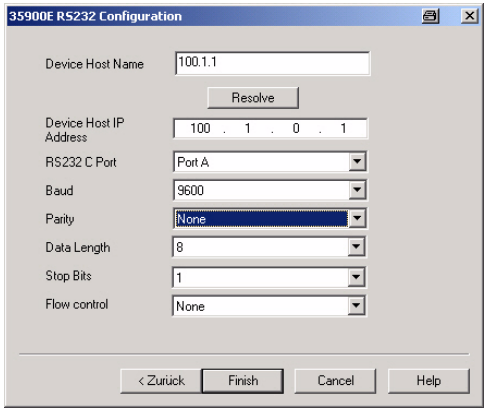

Figure 37 35900E RS232 Configuration

a Enter the host name or IP address of the Agilent 35900E to which the instrument is connected into the field **Device Host Name.**

b Click on button **Resolve**.

c The IP address is displayed in the field **Device Host IP Address**.

d Select from the drop-down list **RS232C Port** the ADC channel, to which the device is connected with the RS232C cabling. In this case the device is cabled to **Port A** at the ADC.

e Use the defaults in the other drop-down lists.

f Click on button **Finish**.

15 All the configured devices are displayed in the **Configured Devices** table in the dialog **Configure Instruments**.

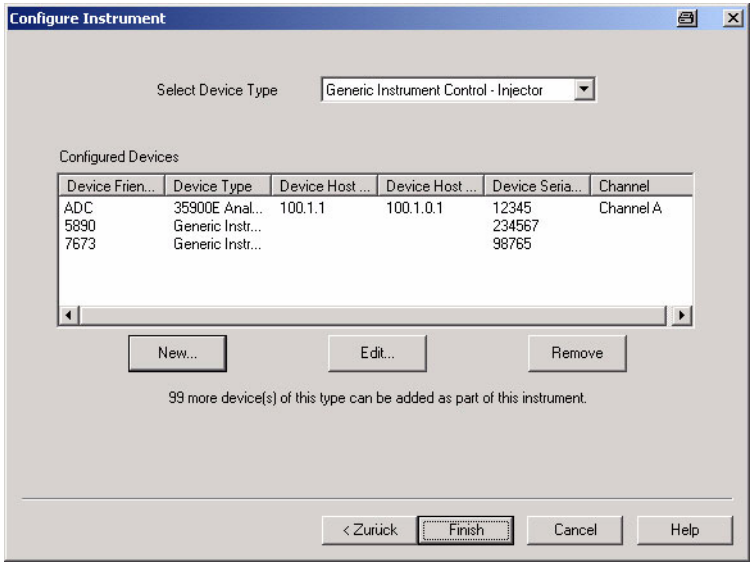

Figure 38 Configured devices for logical instrument

a Click on button **Finish**.

NOTE

Tip:
To save the changes to the database server, just click into a different part of the tree view. The save changes dialog will appear automatically.

b Click on icon **Save** in the tool bar to save the new configured instrument to the data base.

c The instrument is added to the folder **Instruments** and available for use in the data system.

Add a Shimadzu LC-10Avp

In this example the Shimadzu LC-10Avp device is configured with an ADC converter as a logical instrument. The Shimadzu LC-10Avp itself is a modular device.

1 Open the Cerity Software Administration program.

a Click in the selection tree on the folder of the Acquisitions controller for which you want to add an instrument.

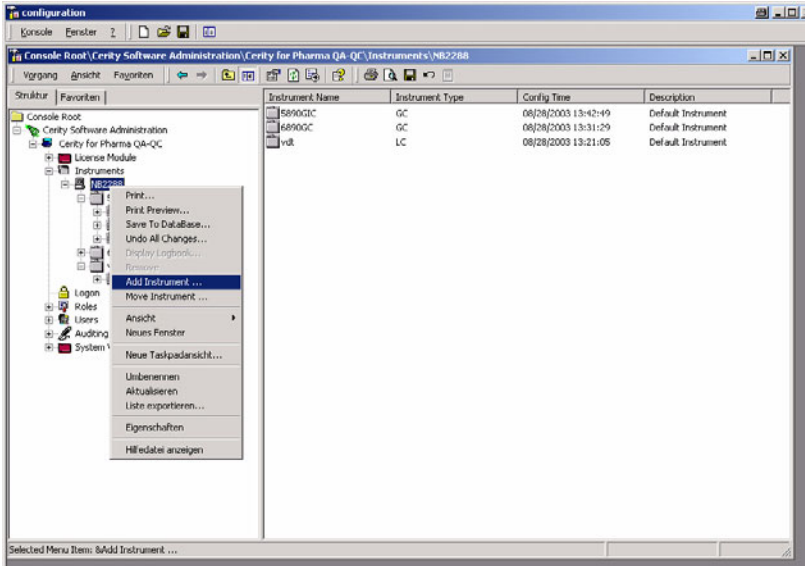

Figure 39 Add instrument

b Click on the menu item **Action** and select **Add Instrument**, or

c open the context menu with a right-click and select **Add Instrument**.

2 The dialog **Add New Instrument** opens.

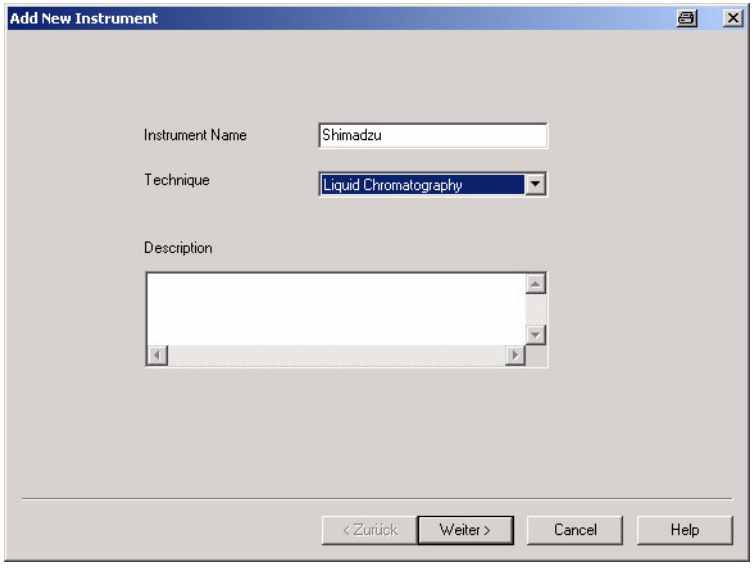

Figure 40 Add new instrument

a Enter the instrument name (for example `Shimadzu`) in the field **Instrument Name**.

b Select **Liquid chromatography** from the drop-down list **Technique**.

c Enter a description in the field **Description** (optional).

d Click on button **Next**.

3 The dialog **Configure Instrument** opens.

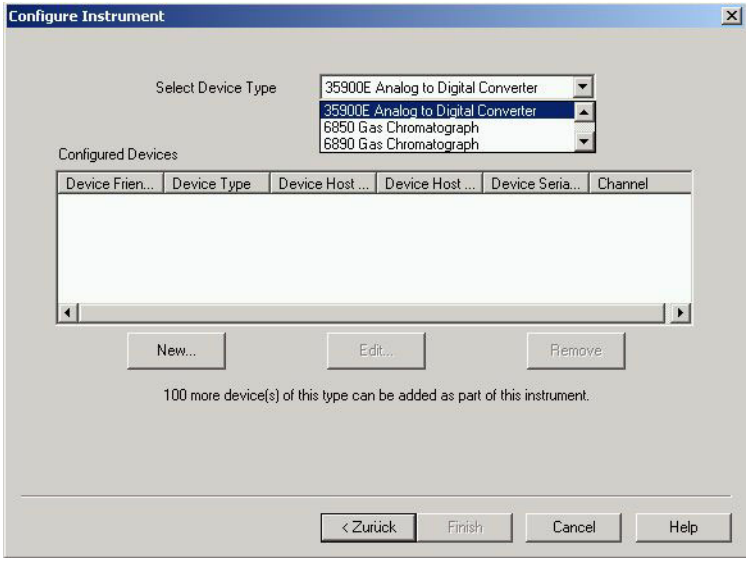

Figure 41 Configuration Instrument

a Select from the drop-down list **Select Device Type** first the item **35900E Analog to Digital Converter**.

b Click on button **New**.

4 The dialog **Identification** opens.

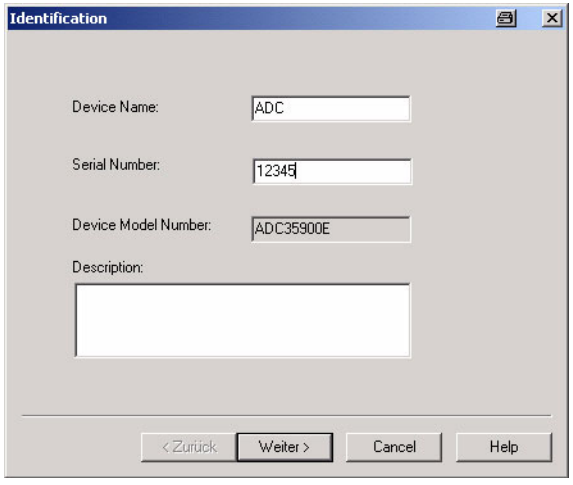

Figure 42 Identification

a Configure the ADC.

b Enter the device name (e.g. ADC) in the field **Device Name**.

c Enter in the field **Serial Number** the serial number of the device.

d Enter in the field **Description** a description of the device (optional).

e Click on button **Next**.

5 The dialog **Connections** opens.

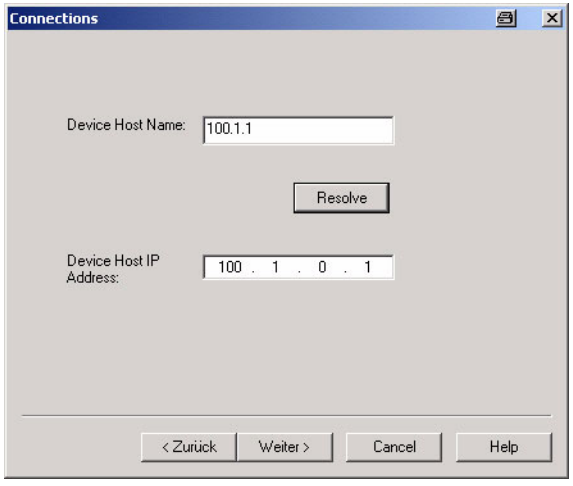

Figure 43 Connections

a Enter the host name or IP address of the ADC into the field **Device Host Name.**

b Click on button **Resolve**.

c The IP address is displayed in the field **Device Host IP Address**.

d Click on button **Next**.

6 The dialog **Channel Information** opens.

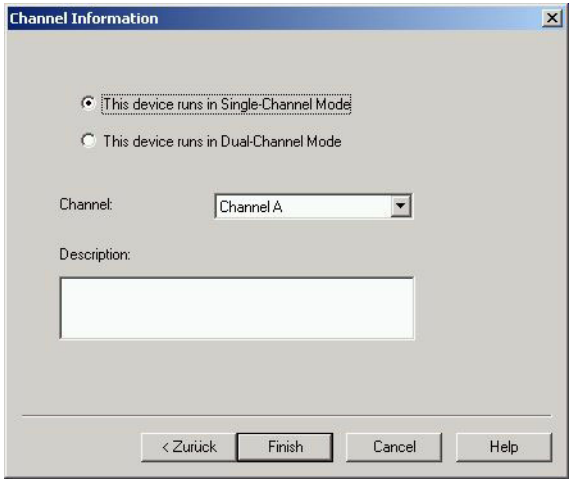

Figure 44 Channel Information

a Check either the option **„This device runs in Single-Channel Mode“** or the option **„This device runs in Dual-Channel Mode“**.

Single-Channel Mode If you choose the Single-Channel Mode, you can connect up to two Shimadzu LC-10Avp with or without an Shimadzu SPD-10AVvp detector to the ADC. This mode only allows you to acquire one signal from a single detector.

Dual-Channel Mode If you choose the Dual-Channel Mode, you can connect a single Shimadzu LC-10Avp (with or without an SPD-10AVvp detector) to the ADC. This mode allows you to acquire data from one or two detectors or two signals from a single detector at the same time.

b Depending on which physical channel your instrument is connected to the ADC, select from the drop-down list **Channel A** or **B**. (You can only choose between **Channel A** or **B** in the Single-Channel Mode).

c Enter a description in the field **Description** (optional).

d Click on button **Finish**.

7 The dialog **Configure Instrument** opens. The just configured device ADC is displayed in the **Configured Devices** table.

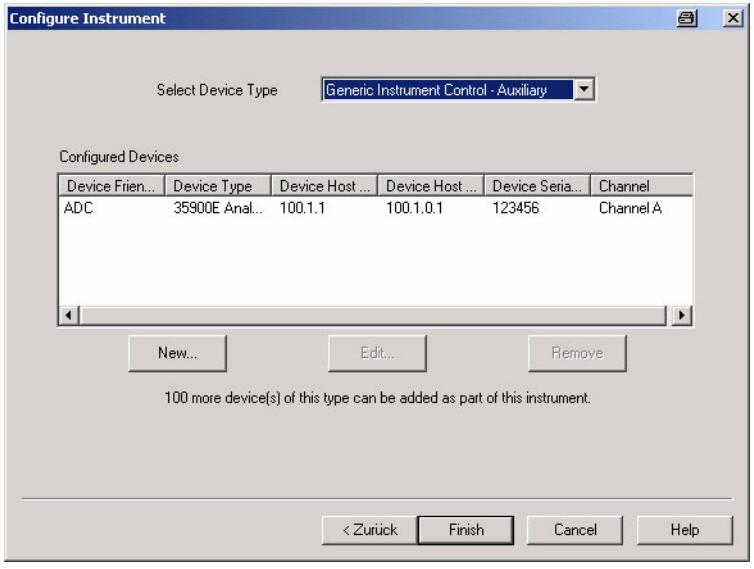

Figure 45 Configure Instrument

a To add an additional device to the instrument, select the device **Generic Instrument Control-Auxiliary (SH-SCL10A)** from the drop-down list **Select Device Type.**

b Click on button **New.**

8 The dialog **Identification** opens.

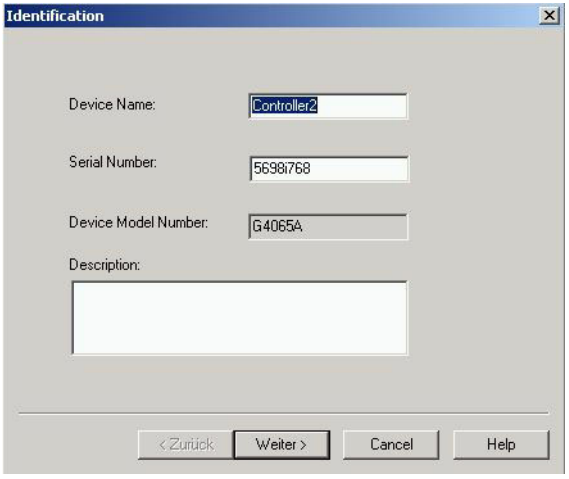

Figure 46 Identification Shimadzu Controller

a Configure the Shimadzu LC-10Avp

b Enter a device name (e.g. `Controller`) in the field **Device Name**.

c Enter in the field **Serial Number** the serial number of the device.

d Enter in the field **Description** a description of the device (optional).

e Click on button **Next**.

9 The dialog **Module Configuration** opens.

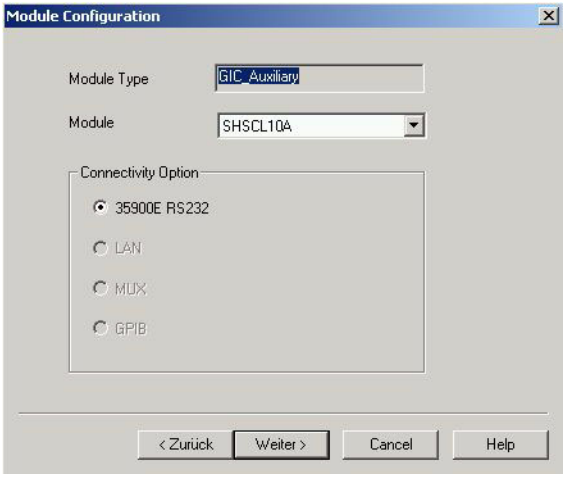

Figure 47 Modul Configuration

a The field **Module Type** displays the identification of the device, in this case **GIC_Auxiliary**.

b Select from the drop-down list **Module**, the instrument you want to add, in this case **SH-SCL10A**.

c Check the **Connectivity** option box for the instrument, in this case **35900E RS232.**

d Click on button **Next**.

10 The dialog **35900E RS232 Configuration** opens.

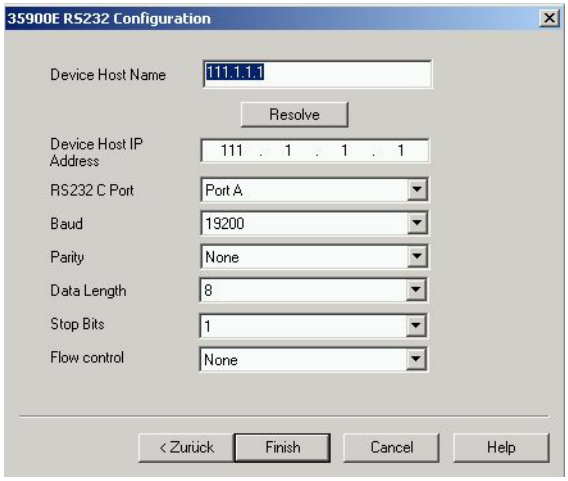

Figure 48 35900E RS232 Configuration

a Enter the host name or IP address of Agilent 35900E to which the instrument is connected into the field **Device Host Name.**

b Click on button **Resolve**.

c The IP address is displayed in the field **Device Host IP Address**.

d Select from the drop-down list **RS232C Port** the ADC channel, to which the device is connected with the RS232C cabling. In this case the device is cabled to **Port A** at the ADC.

e Select from the drop-down list **Baud** the parameter for the Baud-rate, here **19200** is selected.

f Select from the drop-down list **Parity** the parity for the device. In this example **Even** is selected.

g Select from the drop-down list **Data Length** the amount of data bits the data is transferred in. Here **7** (one bite) is selected.

h Select from the drop-down list **Stop Bits** the amount of stop bits here **1** is selected.

i Select from the drop-down list **Flowcontrol** the parameter for the flow control, here **None** is selected.

j Click on button **Finish**.

11 Repeat steps 7 to 10 for all modular devices you want to configure.

12 All the configured devices are displayed in the **Configured Devices** table in the dialog **Configure Instruments**.

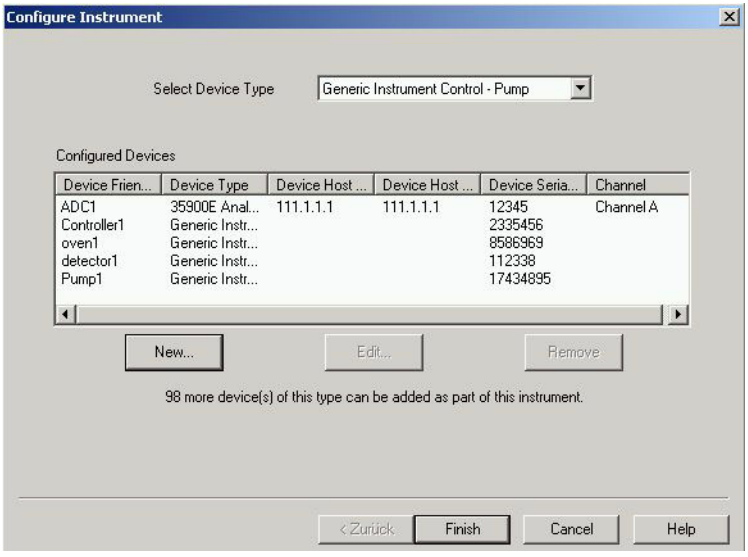

Figure 49 Configured devices for logical instrument

a Click on button **Finish**.

NOTE

Tip:
To save the changes to the database server, just click into a different part of the tree view. The save changes dialog will appear automatically.

b Click on icon **Save** in the tool bar to save the new configured instrument to the data base.

c The instrument is added to the folder **Instruments** and available for selection in the Method Wizard in Cerity.

Adding licenses

Please refer to the Cerity online-help for instructions on how to add a license to the system.

Configuring hardware options

The concept of the generic instrument control allows developers to add specified hardware components to be build into the chromatographic instrument. These hardware components can be selected in the *GIC* **Instrument configuration** as "options". An option is typically associated with a certain list of instrument setpoints, which are available if this option is installed. *GIC* cannot detect these options automatically, the user selects the options.

1. Select in the menu bar from the short cut drop-down list the item **Instrument**.
2. Select an instrument from the treeview.
3. Select the device panel for which you want to change an option.
4. Make a right-click on the display fields.
5. The option dialog opens.
6. Select an option and move the option via » in the selected options column.

For example: The 5890 VSIA allows to configure the option "PressureProgram" for the Inlet A. This option defines if electronic pressure control is installed on this inlet or not. Enabling this option will allow to enter the corresponding setpoints (for example pressure and column length) as part of the Cerity instrument method.

NOTE Important: If the options configuration of any module of an instrument is changed the user has to create an appropriate method for this configuration. Methods which do not match the current options configuration cannot be run on the instrument.

Detailed lists of the supported options and related setpoints are in the appendix of this manual. Please refer to the Cerity online help for further information under **User Interface Reference > Views and Related Dialog Box Help > Instrument View: Selection tree > Instrument panel > Instrument Control > GIC Instrument configuration > Options.**

Appendix

Hewlett Packard instruments 84
Supported configurations 84
Setpoints HP 5890 85
Setpoints HP 7673 89

Shimadzu LC-10Avp instrument 91
Supported configurations 91
SCL-10Avp System Controller 92
SPD-10AVvp Detector 94
DGU-14Avp Degasser 93
CTO-10ACvp Column 96
LC-10ADvp Pumps 96
SIL-10ADvp Auto Injector 101

This appendix offers you an overview of the supported configurations and setpoints supported by *GIC* for Hewlett Packard and Shimadzu instruments.

Hewlett Packard instruments

Supported configurations

The HP 5890/7673 VSIA supports the following hardware configurations:

Table 5 Supported HP 5890 hardware

Hardware	Supported configurations	Comments
5890 GC	HP 5890 Series II and HP 5890 Plus	The 19257–60020 card (revision C or higher) is needed for controlling the instrument GC ROM firmware revision "HP5890A.03.00 or higher
Inlets	Split/Splitless and Cooled On Column	The inlets are supported with or without EPC
Electronic Pressure Control	2-Channel or 6-Channel EPC	The 5890 VSIA supports EPC Channels A,B,C,D,E and F
Detectors:	TCD, FID, NPD, ECD and FPD	Time-programmable polarity switching for the TCD is not supported
Oven	Standard oven with or without cryogenic cooling	

Table 6 Supported HP 7673 hardware

Hardware	Supported configurations	Comments
ALS Controller	G1512A	Firmware revision A.01.05 or higher
ALS Injector	18593B and G1513A	8 Vial high-density turret is not supported
Sample tray	100 vial tray (18596B/C)	Barcode reader is not supported

Setpoints HP 5890

Table 7 Oven - default setpoints

Set point Name	Description	Default Value/Unit	Accepted value
Initial Temp	Oven Initial temp	50 (Degree Centigrade)	-80 - 450
Initial Time	Oven Initial time	0.0 (Minutes)	0- 650
Equilibration Time	Equilibration Time of oven	0.0 (Minutes)	0-200
Oven Temp Table	To enter three ramp for oven program.		

Table 8 Setpoints Cryogenic Cooling

Set point Name	Description	Default Value/Unit	Accepted value
Cryo	Setpoint to Cool Oven	OFF	ON/OFF
Cryo Blast	Used for fast cooling	OFF	ON/OFF
Cryo Ambient Temp	To optimize usage of Cryo gas.	50 (Degree Centigrade)	0-400

Table 9 Inlet A/B - Default setpoints

Set point Name	Description	Default Value/Unit	Accepted value
Initial Temperature	Initial Temp of InletA/B	50 (Degree Centigrade)	0-400
PurgeA/B Initial Value	Whether purge A/B will be on or Off initially.	ON	ON/OFF
PurgeA/B On Time	If Purge A/B is Off then On time in minutes.	0.0 (Minutes)	0.0 – 650.0

Table 9 Inlet A/B - Default setpoints (continued)

Set point Name	Description	Default Value/Unit	Accepted value
PurgeA/B Off Time	If purge is On then Off time in Minutes.	0.0 (Minutes)	0.0 – 650.0
Splitless Injection	Whether injection will be split or splitless.	YES	YES / NO

Table 10 Option - Setpoints pressure program

Set point Name	Description	Default Value/Unit	Accepted value
Initial Pressure	Initial Pressure of InletA/B	0.0 (psi)	0.0-100.0 psi
Initial Pressure Time	Time gap before first ramp.	0.0 (Minutes)	
Inlet A/B pressure Table	Table for Pressure program.		
ColumnA/B length	Length of column in meters.	5.0 Meter	1.0 – 50.0
ColumnA/B diameter	Diameter of column in micrometers.	0.02 Micrometer	
ColumnA/B gas	Gas used in Column	He	He,N2,H2, Ar/CH4
Vaccum Compensation		OFF	ON/OFF

Table 11 Setpoints Cooled-On columns

Set point Name	Description	Default Value/Unit	Accepted value
Oven Track	If Oven Track is ON then Inlet will follow Oven Temperature program.	OFF	ON/OFF

Table 11 Setpoints Cooled-On columns (continued)

Set point Name	Description	Default Value/Unit	Accepted value
Initial Temp time	Time gap before first ramp.	0.0 (Minutes)	0-650 Min.
InletA/B temp table	Table for Temperature program.		

Table 12 Setpoints Capillary column

Set point Name	Description	Default Value/Unit	Accepted value
Carrier Gas	Carrier gas for capillary column		He,N2,H2, Ar/CH4

Table 13 Default setpoints Detector A/B

Set point Name	Description	Default Value/Unit	Accepted value
Detector	Status	ON	ON/OFF
Range	It selects and sizes a portion of the full dynamic range for the signal source assigned to an output channel.	0	0 –13
Attenuation	It further selects and sizes a portion of the ranged signal for the + 1 **mV** output to ensure that the signal does not exceed + 1 **mV**.	0	0 – 10
Detector A/B Temp		50	

Table 14 Setpoints TCD option

Set point Name	Description	Default Value/Unit	Accepted value
Sensitivity	Sensitivity of TCD	LOW	HIGH /LOW
Polarity	Polarity of TCD	+	+/-

Auxiliary Set Points (no default setpoints)

Table 15 Setpoints channel C

Set point Name	Description	Default Value/Unit	Accepted value
Channel C initial Time	Initial Pressure of Channel C	0.0 (Minutes)	0-650 Min.
Channel C Initial Pressure	Channel C Initial Pressure	0.0 (psi)	0.0 - 100.0 psi

Table 16 Setpoints Channel D

Set point Name	Description	Default Value/Unit	Accepted value
Channel D initial Time	Initial Pressure of Channel D	0.0 (Minutes)	0-650 Min.
Channel D Initial Pressure	Channel D Initial Pressure	0.0 (psi)	0.0 – 100.0 psi

Table 17 Setpoints Channel E

Set point Name	Description	Default Value/Unit	Accepted value
Channel E initial Time	Initial Pressure of Channel E	0.0 (Minutes)	0-650 Min.
Channel E Initial Pressure	Channel E Initial Pressure	0.0 (psi)	0.0 – 100.0 psi

Table 18 Setpoints Channel F

Set point Name	Description	Default Value/Unit	Accepted value
Channel F initial Time	Initial Pressure of Channel F	0.0 (Minutes)	0-650 Min.
Channel F Initial Pressure	Channel F Initial Pressure	0.0 (psi)	0.0 – 100.0 psi

Setpoints HP 7673

Table 19 Default Setpoints HP 7673

Set point Name	Description	Default Value/Unit	Accepted value
Inject From	Specifies Tower (FRONT, BACK), which will be used for injection.	Front Injector	Front Injector/ Back Injector
Tray Present	Specifies whether tray is present or not.	YES	YES/NO
Sample Pumps	Specifies the number of times the syringe plunger is moved up and down while the needle is in the sample to expel air bubbles and improve reproducibility.	6	0 to 15
Viscosity Delay	Specifies the number of seconds the plunger pauses at the top of the stroke during sample pump, sample draw, and sample and solvent washes.	0	0 to 7 seconds
Sample Pre wash	Specifies the number of times the syringe is rinsed with sample before the injection.	0	0 to 15
Solvent A Post wash	Specifies the number of times the syringe is rinsed with solvent from the solvent A bottle after injection.	0	0 to 15
Solvent B Post wash	Specifies the number of times the syringe is rinsed with solvent from the solvent B bottle after injection.	0	0 to 15
Slow Plunger Enable	This set point specifies the speed of the syringe plunger during the injection stroke and whether or not the syringe needle stays in the inlet (dwell time) after injection of the sample.	OFF	OFF/ON
Solvent A Pre wash	Specifies the number of times the syringe is rinsed with solvent from the solvent A bottle before injection.	0	0 to 15
Solvent B Pre wash	Specifies the number of times the syringe is rinsed with solvent from the solvent B bottle before injection.	0	0 to 15

Table 19 Default Setpoints HP 7673 (continued)

Set point Name	Description	Default Value/Unit	Accepted value
Syringe Size	Size of Syringe	1ml	1/10 ml
Injection Mode	Specifies mode of injection (High Speed or on-column)	High Speed	High Speed, On-Column
Waste Mode	Specifies waste mode for injector towers	A only	A only. B only, Alternate.
Sample Skim Enable		OFF	ON/OFF
Sample Skim Depth	This setpoint allows you to move the position of the needle tip up or down to approximate locations from the nominal position of zero (default).	0	-2 to 30 mm
Pre-Injection Dwell	Time in minute for the needle to stay in the inlet before the plunger is depressed to inject sample.	0	0 to 1.0
Post-Injection Dwell	Time in minute for the needle to stay in the inlet after the plunger is depressed to inject sample.	0	0 to 1.0

Shimadzu LC-10Avp instrument

Supported configurations

The Shimadzu *VSIA*s support the following instrument modules:

Table 20 VSIA supported Shimadzu instruments

Module	Description	VSIA
SIL-10Avp	Auto Injector (Auto sampler)	SH_SIL-10AD
LC-10ADvp	Solvent Delivery Module (Pump)	SH_LC-10AD_BIN (binary pump) SH_LC-10AD_ISO (isocratic pump) SH_LC-10AD_LPG (low pressure gradient)
FCV-10ALvp	Switching Valve for quaternary gradient	no VSIA necessary, handled by system controller
DGU-14Avp	Degasser	no VSIA necessary, handled by system controller
SCL-10Avp	System Controller	SH_SCL-10A
SPD-10AVvp	UV/VIS Detector	SH_SPD-10AV
SPD-10Avp	UV/VIS Detector	SH_SPD-10A
CTO-10ACvp	Column compartment	SH_CTO-10AC
CTO-10ASvp	Column compartment	SH_CTO-10AS

Actual Values

Actual values are taken from a Shimadzu system, in accordance with the actuals shown by the Shimadzu software itself.

All parameters used in GUI to display as actuals are marked with a check mark in the column “Actual”. All parameters that can be shown in the realtime plot (RTP) are marked with a check mark in the column “RTP”.

SCL-10Avp System Controller

Table 21 SCL-10Avp System Controller default setpoints

Display Label	Description	Remarks
Auto zero detector A	Auto zero detector A (0/1: off/on)	0/1
Auto zero detector B	Auto zero detector B (0/1: off/on)	0/1
System protect	System protect (0/1: off/on)	0/1
Sound alarm on error	Alarm (0/1: disable/enable)	0/1
Turn off relays on error	Turn off on error (0/1: disable/enable)	0/1
Enable status log	Status log (1: ON, 0: OFF)	0/1
Status log period	Sampling rate of status log (msec)	Set to 1000 msec
External start	External start (0/1/2 : none/all runs/inj only)	0/1/2
Pressure units	Set pressure units (0/1/2/3: kgf/cm^2 / psi / MPa / bar	0/1/2/3
Injection trigger	Injection trigger (0/1 : RUN/SYNC)	0/1
Auto injector online	Auto injector online (0/1 : offline/online)	0/1
Relay 1	Configuration of terminal controller relay output (0/1/2/3 : start/stop/error/event)	0/1/2/3
Relay 2	see Relay 1	0/1/2/3
Relay 3	see Relay 1	0/1/2/3
Relay 4	see Relay 1	0/1/2/3

Table 22 Setpoints subcontroller

Display Label	Description	Remarks
Rotary valve A	Valve A position	0/1
Rotary valve B	Valve B position	0 - 1 (Step 1)
Rotary valve C	Valve C position	1 - 6 (Step 1)
Rotary valve D	Valve D position	1 - 6 (Step 1)

DGU-14Avp Degasser

Table 23 Setpoints DGU-14 Avp degasser

Display Label	Description	Remarks
Degasser	Controls degasser state (0 : Off, 1 : Degas, 2 : PURGE)	0 - 2 (Step 1)

Table 24 Setpoints BOX-L (Only if syringe unit is installed)

Display Label	Description	Remarks
Syringe suction speed	Controls syringe unit aspiration speed (µl/sec.)	1 - 150 (Step 1)
Syringe discharge speed	Controls syringe unit discharge speed (µl/sec.)	1 - 150 (Step 1)

Table 25 Actual values system controller

Actual	Description	Remarks	Actual	RTP
Rotary valve A	Valve A position		✔	-
Rotary valve B	Valve B position		✔	-
Rotary valve C	Valve C position		✔	-
Rotary valve D	Valve D position		✔	-

SPD-10AVvp Detector

The detector is represented by one module with options for one or both of detectors A and B. The display labels along with the controller commands are different only in the first character (A for detector A, B for detector B).

Table 26 Default setpoints detector

Display Label	Description	Remarks
Detector	Sets name of detector (A/B = Detector A/Detector B)	The commands are given in format x<Command> with x meaning A or B according to the detector selected here
Wavelength Ch 1	Wavelength 1 (nm)	190 - 370 (D2) (Step 1) 371 - 900 (W) (Step 1)
Lamp	Lamp status (0/1/2 = OFF/D2/W)	0 - 2 (Step 1)
Response	Response	1 - 10 (Step 1)
Polarity	Polarity (1 / -1 = + / -)	-1/1
Auxiliary range	AUX range (1/2/3/4/5/6 = 0.5/1/2/4/1.25/2.5 AU/V)	1 - 6 (Step 1)
Range	Recorder range (0 = recorder shortened)	0.000 - 2.560 (Step 0.001)
Threshold level	Solvent recycle valve switching threshold (AU)	0.0000 - 1.0000 (Step 0.0001)
Valve delay time	Solvent recycle valve switching delay time (sec.)	0.0 - 99.9 (Step 0.1)

Table 27 Option: Dual Mode

Display Label	Description	Remarks
Wavelength Ch 2	Wavelength 2 (nm)	190 - 370 (D2) (Step 1) 371 - 900 (W) (Step 1) available in DUAL mode

Table 28 Actual values detector

Actual	Description	Remarks	Actual	RTP
Detector	Name of detector (A/B)	The commands are given in format x<Command> with x meaning A or B according to the detector selected here	✔	-
Wavelength Ch 1	Wavelength 1 (nm)		✔	-
Wavelength Ch 2	Wavelength 2 (nm)		✔	-
Lamp	Lamp status (0/1/2 = OFF/D2/W)		✔	-
Response	Response		-	✔
Sample energy	Sample energy (mV)		-	✔
Reference energy	Reference energy (mV)		-	✔
AUX range	AUX range (1/2/3/4/5/6 = 0.5/1/2/4/1.25/2.5 AU/V)		-	-
Polarity	Polarity (1 / -1 = + / -)		-	-
D2 on time	D2 lamp on time (hour)		-	-
W on time	W lamp on time (hour)	only for SPD-10AVvp	-	-

CTO-10ACvp Column

Table 29 CTO-10ACvp Column (oven) default setpoints

Display Label	Description	Remarks
Oven temp.	Set temperature of oven (°C)	1 ~ 80 (step: 1)
T.MAX	Upper temperature limit for oven (°C)	5 ~ 85 (step: 1)

Table 30 Actual values oven

Actual	Description	Actual	RTP
Oven temp	Set temperature of oven (°C)	✔	✔
T.MAX	Upper temperature limit for oven (°C)	✔	✔
Room Temp.	Room temperature (°C)	✔	✔

LC-10ADvp Pumps

The solenoid valves are set for each type of pump. The parameters are listed in the table of the according pump.

Each type of pump is represented by an individual module.

Table 31 Default setpoints isocratic pump

Display Label	Description	Remarks
A.Flow	Flow rate pump A (ml/min.)	0.000 - 9.999 (Step 0.001)
A.Pressure	Pressure solvent A (bar)	0.10 - 392.00 (Step 0.01)
P.Max	Maximum pressure (bar)	10 - 432 (Step 1)
P.Min	Minimum pressure (bar)	0 - 392 (Step 1)

Table 32 Setpoints solenoid valve pump A

Display Label	Description	Remarks
Solenoid Valve on Pump A	Number of solenoid valve activated in FCV, pump A	1 - 4 (Step 1)

Table 33 Setpoints pump B

Display Label	Description	Remarks
B.Flow	Flow rate pump B (ml/min.)	0.000 - 9.999 (Step 0.001)
B.Pressure	Pressure solvent B (bar)	0.10 - 392.00 (Step 0.01)
Solenoid Valve on Pump B	Number of solenoid valve activated in FCV, pump B	1 - 4 (Step 1)

Table 34 Setpoints pump C

Display Label	Description	Remarks
C.Flow	Flow rate pump C (ml/min.)	0.000 - 9.999 (Step 0.001)
C.Pressure	Pressure solvent C (bar)	0.10 - 392.00 (Step 0.01)
Solenoid Valve on Pump C	Number of solenoid valve activated in FCV, pump C	1 - 4 (Step 1)

Table 35 Actual values isocratic pump

Actual	Description	Actual	RTP
A.Flow	Flow rate pump A (ml/min.)	✔	✔
B.Flow	Flow rate pump B (ml/min.)	✔	✔
C.Flow	Flow rate pump C (ml/min.)	-	✔
A.Pressure	Pressure solvent A (bar)	✔	✔
B.Pressure	Pressure solvent B (bar)	✔	✔
C.Pressure	Pressure solvent C (bar)	-	✔

Table 36 Default setpoints binary gradient pump

Display Label	Description	Remarks
T.Flow	Total flow rate in gradient pumping (ml/min.)	0.000 - 9.999 (Step 0.001)
B.Conc	Mobile phase B concentration (%)	0 - 100 (Step 1)
B.Curve	Mobile phase B gradient curve	-10 - 10 (Step 1)
P.Max	Maximum pressure (bar)	10 - 432 (Step 1)
P.Min	Minimum pressure (bar)	0 - 392 (Step 1)

Table 37 Setpoints solenoid valve pump A

Display Label	Description	Remarks
Solenoid Valve on Pump A	Number of solenoid valve activated in FCV, pump A	1 - 4 (Step 1)

Table 38 Setpoints solenoid valve pump B

Display Label	Description	Remarks
Solenoid Valve on Pump B	Number of solenoid valve activated in FCV, pump B	1 - 4 (Step 1)

Table 39 Setpoints pump C

Display Label	Description	Remarks
C.Flow	Flow rate pump C (ml/min.)	0.000 - 9.999 (Step 0.001)
Solenoid Valve on Pump C	Number of solenoid valve activated in FCV, pump C	1 - 4 (Step 1)

Table 40 Actual values binary gradient pump

Actual	Description	Remarks	Actual	RTP
T.Flow	Total flow rate in gradient pumping (ml/min.)		✔	✔
A.Pressure	Pressure solvent A (bar)		✔	✔
B.Conc	Mobile phase B concentration (%)		✔	✔
C.Flow	Flow rate pump C (ml/min.)		-	✔
B.Pressure	Pressure solvent B (bar)	if PUMP.B installed	✔	✔
C.Pressure	Pressure solvent C (bar)	if PUMP.C installed	-	✔

Table 41 Low pressure gradient pump default setpoints

Display Label	Description	Remarks
T.Flow	Total flow rate in gradient pumping (ml/min.)	0.000 - 9.999 (Step 0.001)
P.Max	Maximum pressure (bar)	10 - 432 (Step 1)
P.Min	Minimum pressure (bar)	0 - 392 (Step 1)

Table 42 Setpoints pump B

Display Label	Description	Remarks
B.Conc	Mobile phase B concentration (%)	0 - 100 (Step 1)
B.Flow	Flow rate pump B (ml/min.)	0.000 - 9.999 (Step 0.001)
B.Curve	Mobile phase B gradient curve	-10 - 10 (Step 1)
Solenoid Valve on Pump B	Number of solenoid valve activated in FCV	1 - 4 (Step 1)

Table 43 Setpoints pump C

Display Label	Description	Remarks
C.Conc	Mobile phase C concentration (%)	0 - 100 (Step 1)
C.Flow	Flow rate pump C (ml/min.)	0.000 - 9.999 (Step 0.001)
C.Curve	Mobile phase C gradient curve	-10 - 10 (Step 1)
Solenoid Valve on Pump C	Number of solenoid valve activated in FCV	1 - 4 (Step 1)

Table 44 Actual values low pressure gradient pump

Actual	Description	Remarks	Actual	RTP
T.Flow	Total flow rate in gradient pumping (ml/min.)		✔	✔
A.Pressure	Pressure solvent A (bar)		✔	✔
B.Conc	Mobile phase B concentration (%)		✔	✔
B.Flow	Flow rate pump B (ml/min.)		✔	✔
B.Pressure	Pressure solvent B (bar)	if PUMP.B installed	-	✔
C.Conc	Mobile phase C concentration (%)		-	✔
C.Flow	Flow rate pump C (ml/min.)		-	✔
C.Pressure	Pressure solvent C (bar)	if PUMP.C installed	-	✔
D.Conc	Mobile phase D concentration (%)		-	✔
LPGE.Mode	Gradient mode (0: Auto, 1: 1-cycle, 4: 4-cycle)		-	✔

SIL-10ADvp Auto Injector

The number of vials available depends on the rack type installed. The vial range for the various rack types is listed in the following table:

Table 45 Vial range

Rack Type	Vial Range
Rack 1, 11	0 – 149
Rack 2, 12, 12A	0 – 69
Rack 3, 13	0 – 59
Rack 4	1 – 192
Rack 5	1 - 768
Rack 6, 16	Sample vials: 0 – 99 Reagent vials: 101 – 103
Rack 7	Sample vials: 0 – 59 Reagent vials: 101 - 103

Table 46 Setpoints auto injector - Default setpoints

Display Label	Description	Remarks
Sample rack	Rack select	1 - 7 or 11 - 17 (Step 1)
Rinsing volume	Rinse volume (µl)	1 - 2000 (Step 1)
Needle stroke	Needle stroke (mm)	(step: 1 for all) (RACK1/11): 20 - 54 (RACK2/12): 20 - 43 (RACK3/13): 20 - 54 (RACK4/14): 8 - 22 (RACK5/15): 8 - 22 (RACK6/16): 20 - 54 (RACK7/17): 20 - 54
Rinsing speed	Rinsing syringe speed (µl/sec.)	1 - 35 (Step 1)
Sampling speed	Sampling syringe speed (µl/sec.)	0.1 - 15 (Step 0.1)

Table 46 Setpoints auto injector - Default setpoints (continued)

Display Label	Description	Remarks
MTP tray	Microtiter plates	0: Single (1 microtiter plate) 1: Dual (2 microtiter plates)
Cooler temp	Cooler temperature (°C)	4 - 35 (Step 1)
Purge time	Purge time (min)	1.0 - 10.0 (Step 0.1)
Rinse mode	Rinsing mode (0/1/2/3)	0: No rinsing 1: Rinsing before aspiration of sample 2: Rinsing after aspiration of sample 3: Rinsing before and after aspiration of sample
Rinse diptime	Rinsing diptime (sec.)	0-60 (Step 1)

Table 47 Actual values auto injector

Actual	Description	Remarks	Actual	RTP
Sample rack	Rack code		✔	-
Cooler temp	Cooler temperature (°C)	only when sample cooler is installed	✔	✔
Rinsing volume	Rinse volume (µl)		-	-
Needle stroke	Needle stroke (mm)		-	-
Rinsing speed	Rinsing syringe speed (µl/sec)		-	-
Sampling speed	Sampling syringe speed (µl/sec)		-	-
Purge time	Purge time (min)		-	-
Rinse mode	Rinse mode			
Rinse diptime	Rinse dip time			

Index

A

Agilent 35900E, 15
Agilent analog/digital converter AD 35900E, 11
analog digital converter, 15
Analog signal cable, 27, 31

C

Cerity GIC Architecture, 12
Common Instrument Control Language, 10
CTO-10ACvp column, setpoints, 96

D

developer kit, 13
DGU-14Avp degasser, setpoints, 93

G

Generic Instrument Control, 8
GIC, 8
GIC Architecture, 12
GIC framework, 10

H

Hardware requirements, 18
Hewlett Packard instruments, 84
HP 5890, setpoints, 85
HP 7673, setpoints, 89

I

Installation Qualification (IQ), 9
Integrated instrument, 52

L

LC-10ADvp pumps, setpoints, 96
license, 82

M

Mixed configuration, 49
Modular instrument, 52

O

Operational Qualification (OQ), 9
options, 82

P

PD-10AVvp detector, setpoints, 94
Plug-and-play, 10

R

Remote Start/Stop cable, 30
RS232C cable, 27, 29
RSS cable, 27

S

SCL-10Avp system controller, setpoints, 92
Shimadzu LC-10Avp, 71, 91
SIL-10ADvp Auto Injector, setpoints, 101
Software, requirements, 18

V

Vendor Specific Instrument Adapters, 8, 17
VSIA Installation, 19
VSIA XML, 11

www.agilent.com

In This Book

This is a user manual for the Generic Instrument Control. This manual is written for system administrators and end users, who will connect and configure a non-Agilent instrument to the Cerity system.

The manual describes how to physically connect and configure a GIC based instrument to the Cerity Pharmaceutical QA/QC application.

© Agilent Technologies, Deutschland GmbH 2003

Printed in Germany
11/2003

G4000-90060

Agilent Technologies